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THE AMERICAN

# School Board Journal

A PERIODICAL OF SCHOOL ADMINISTRATION

ANNUAL BUILDING NUMBER

VOLUME 108, NUMBER 1

JANUARY, 1944



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## WHAT OF THE YEAR 1944?

The thoughtful school administrator never forgets the timely anticipation of future needs. The schools must not only be kept going—they must be geared to the exigencies of a future day.

Hence, there must be a constant look into the coming years. What will the year 1944 exact? Will things be different than they were during the year just closed? No one can answer this question with a degree of certainty.

For the present, it must be realized that the war is approaching its most serious stage and that popular education and the schools as an organization must cooperate with home-front agencies and must work wholeheartedly to achieve the peace. That is the objective of the hour, to be adhered to sincerely and with all our strength.

But, simultaneously with this important objective are postwar considerations which cannot be ignored. What are the problems as far as they may affect the administration of the schools? Thousands of young men will return from the war front who must be placed in the occupations they left at home. Equally vast numbers of men and women will be released from wartime occupations to be reemployed in the trades and professions of a peacetime economy. These problems must be solved by government, by business—and by education. Last, but not least, the teachers and students who entered the war service must be returned to the schools.

What changes will have to be effected in the course of studies? What new schools and new departments must be established for the adult groups? For those returning with physical or nervous handicaps?

While the answers to these problems are the task of the schoolmaster, he will have to draw upon the layman for important help. The citizen who is in immediate touch with conditions in the industrial field and the social situation must be recruited into service. He may understand the new conditions and suggest solutions which the educator does not sense.

Then, there is the school plant. While in the larger communities it is desirable to close schools in certain sections because of the drop in enrollment, many new school buildings are needed in the growing outskirts and in new residential districts. In many medium-size and smaller communities, there has become manifest an overcrowding for which new schoolhousing must be provided. Old buildings must be adjusted to the new education program and rehabilitated. The older sections and especially the slum areas of cities need the most attractive and widely useful school buildings, be they old or new. Equipment which has been neglected must be restored.

And it is none too early to plan ahead and to contemplate these needs of the future. Every school system will have its own peculiar problems to be solved as local conditions will prompt.

THE EDITOR

# THE AMERICAN School Board Journal

A Periodical of School Administration

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# THE AMERICAN School Board Journal

Volume 108, No. 1

JANUARY, 1944

Subscription, \$3.00 the Year

## The Planning of Classrooms for Postwar School Buildings Charles Bursch<sup>1</sup>

It is always difficult to view the important elements of a large and complex undertaking in proper perspective, giving adequate weight and consideration to each. As a result of this difficulty, unbalanced, unsatisfactory, and overly expensive results are too often obtained.

The planning of elementary school buildings is a case in point. Among the major complex elements involved are architectural type and appearance of the completed building, construction cost, maintenance cost, annual cost, planning cost, safety of building design and installations, materials of construction, type of heating, lighting and plumbing installations, size of building; i.e., number and type of classrooms and special rooms, and student circulation.

School administrator, board member, citizen, building committee member, architect, taxpayer, each has his own ranking of these and other elements in the order of their importance. Even though the ultimate success of a school building depends upon the proper ranking and interrelations of important planning elements, this task is often left to individuals or small groups with little or no qualifications or experience in making such decisions. In this connection, it is appropriate to point to something of a blind spot in school administrative practice. I refer to the rather sharp distinction made in many instances be-

tween "educational" matters and those involving the "school plant."

There are still school districts in which board members recognize the sound practice of looking to the trained administrators for recommendations on what they please to call "educational" questions but reserve to themselves the "practical" problems, chief of which are those dealing with school plant. Among board members who resent the tendency to make trained educational leaders real executive officers, it is sometimes pointed out that school plant matters are the one remaining sphere where school boards and individual members may take direct charge. Playing into the hands of this type of board are some school administrators who either do not wish to be bothered with schoolhouse planning problems or who do not fully

recognize the school plant as an important educational instrument.

The planning and construction of improved school buildings, from the point of view of educational usefulness, may not be expected until a better schoolhouse planning procedure is adopted generally in school districts.

The key to the recommended procedure is to have competent persons plan classrooms for specific types of educational service and then organize those classrooms into a workable school building. The planning procedure may be termed successful when it results in a school building composed of classrooms whose sizes and shapes facilitate the adopted educational program and practices, when all of those spaces are sound conditioned and have adequate and easily controlled lighting, heating, and ventilation. Then and then only

is a school building worth what it costs, is it worth being made beautiful, safe structurally, easy and inexpensive to maintain.

When the school plant is given its deserved place of educational significance, the carrying out of planning procedures will fall naturally among the more important duties of the chief executive officer of the school district. Likewise, when such significance is recognized, it will become obvious that no school building can be as well planned without the assistance of the teaching and supervisory staff as with such assistance.

When the superintendent of schools and his entire staff really go to work on plant



A typical classroom in the Larkin School, Monterey, California. — Stanton and Mulvin, Architects, Del Monte, California.

<sup>1</sup>Chief of the Division of Schoolhouse Planning, State of California Department of Education, Sacramento.



Good indoor-outdoor relationships help instructional activities in an activity program.

planning problems, it is inevitable that a different set of values, a different ranking of planning elements than has heretofore prevailed will emerge. Local school administrators and school architects often shudder, at first, at the consequences of planning a school building from the inside out; of designing and orienting classrooms first and then organizing them unimpaired, into the best looking school building possible. It is granted that the resulting buildings may bear little or no exterior resemblance to traditional schools. It is granted also that an adjustment period may be necessary for people to become accustomed to the looks of the new buildings. Such adjustment is normally prompt and satisfactory when the classroom design has been based upon functional requirements.

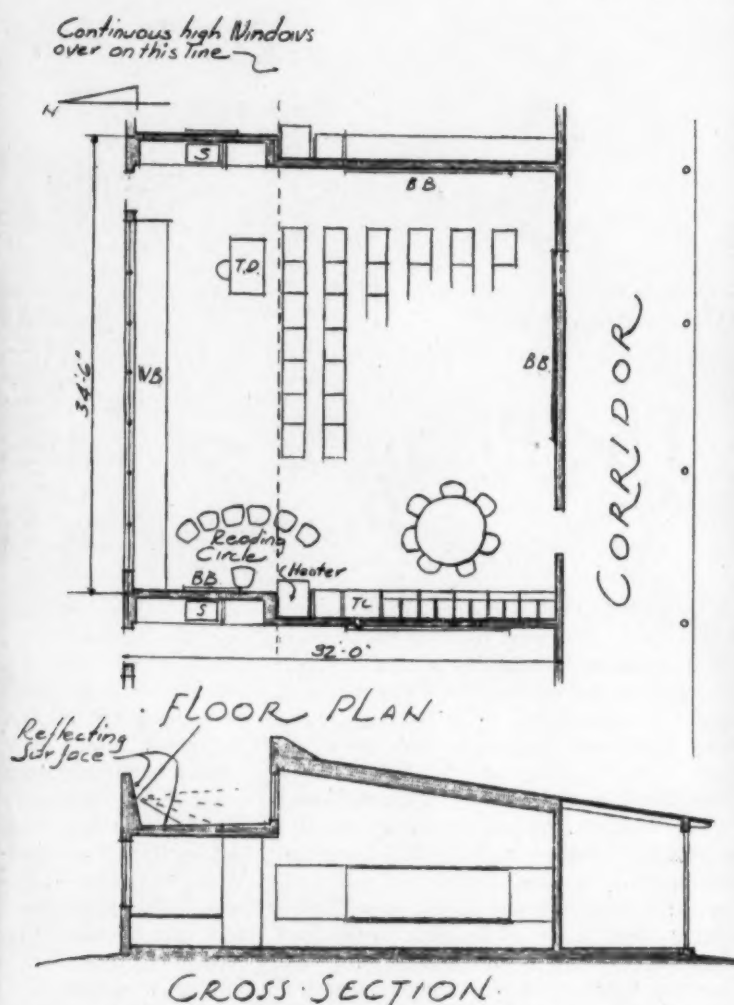
For instance, the reaction of the people gathered for the dedication ceremony of a new type building in a certain California district is typical. Some of the citizens surveyed the building from the outside and agreed that it was a disgrace to the community and selected a spokesman to voice their opinion at the dedication. On the other hand, PTA members toured the building outside and inside and had explained to them the various features in which it differed from traditional practice and why these differences were important. The latter group had the first op-

portunity to speak and when they had finished their intelligent and pointed praise of the building, it was enthusiastically accepted. In fact, the effect upon schoolhouse planning in the area was immediate and far reaching. Besides breaking the ice for different looking school buildings, the success of this building served to draw widespread and favorable attention to the potential contribution to design by a well-known school architect as compared to an architect not so specialized.

Assuming, as we are, that sound classroom design and orientation should dictate largely the plan of a school building, the questions arise: What are the bases of good classroom design? What is good orientation?

Perhaps the most basic element in planning a classroom is its floor area, considering both size and shape. To adopt a classroom floor plan from an existing building or to synthesize one from a list of standards is to fail in real educational planning.

The size and shape of a classroom should be determined by the requirements of the educational work to be done within its confines. The number of pupils to be accommodated in the room also influences its size but generally speaking, except where classwork is highly formalized, the total space requirements for work, interest, and construction centers for small pupil groups exceed those



Classroom in Paso Robles School. Note reflecting surface on parapet.

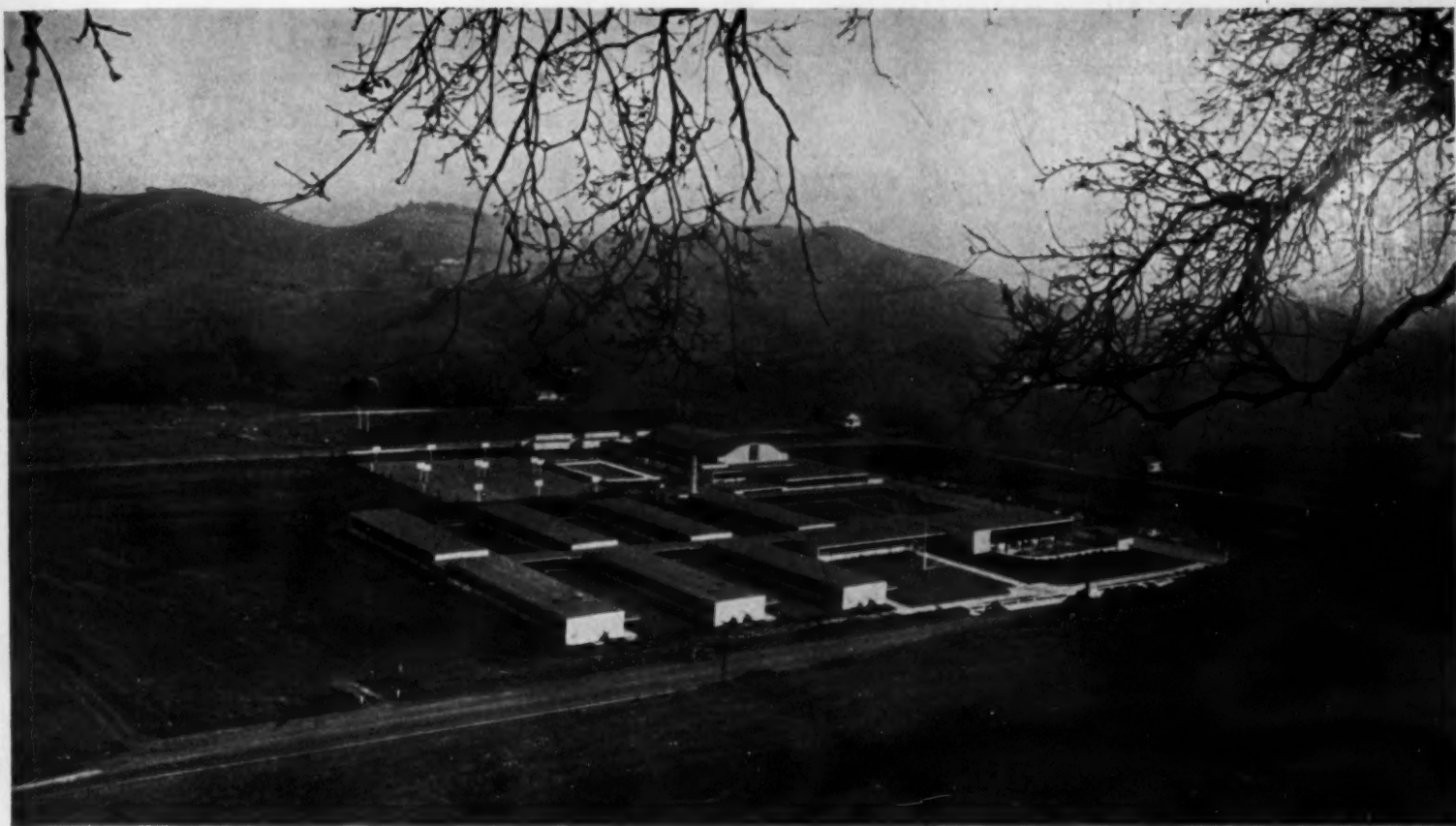
for mere seating space for the class as a whole.

Classroom space planning may well take a leaf from the best in playground development procedure. Square feet per child served was found to be a totally inadequate way to size a playground. There is no reasonable alternative to laying out the properly sized and spaced fields for the games to be played and to have game spaces of sufficient number and variety to care for the peak load on the playground. To do otherwise in space planning for a classroom is to permit the room, instead of the staff, to determine the educational activities to be undertaken. Before the planner can interpret educational activities into space requirements, he must know what types of furniture, fixtures, equipment, exhibits, and supplies are to be used, as well as the number of pupils involved. He must know intimately the storage requirements for instructional supplies and equipment, and for the personal effects and projects of students.

The considerations properly affecting floor space planning of classrooms are many and varied. The previous discussion scarcely scratches the surface, but it does go far enough to indicate that classroom planning working under the requirement of a given classroom span or of unilateral lighting is straight-jacketed. In fact, under such restrictions, the process cannot properly be termed

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All academic classrooms in the Exeter Union High School have north light. — Franklin & Kump, Architects, San Francisco, California.

creative planning at all. It is merely adjustment.

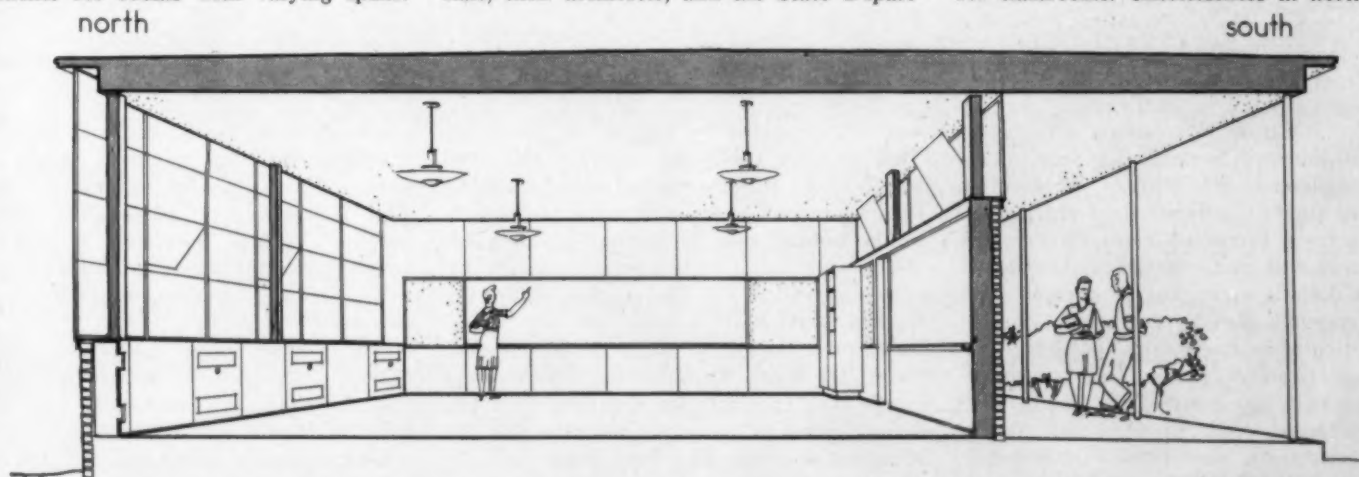
A successful attack upon those major citadels of traditional schoolhouse planning then becomes the key to securing functionally planned schoolrooms. Zest has been added to the attack upon unilateral lighting of classrooms, even when they are of traditional span, since modern light evaluating techniques found it produced indefensible results as to light levels and made informal grouping of pupils a distinct seeing penalty for the part of the group facing the windows. Completely artificial lighting has been proposed by many as the best means of meeting rigid lighting requirements for rooms with varying spans.

While it is granted that artificial lighting can be made to work satisfactorily, it seems, however, that the least those responsible for schoolhouse planning are obliged to do is to attempt a workable and flexible solution that uses natural lighting as far as possible.

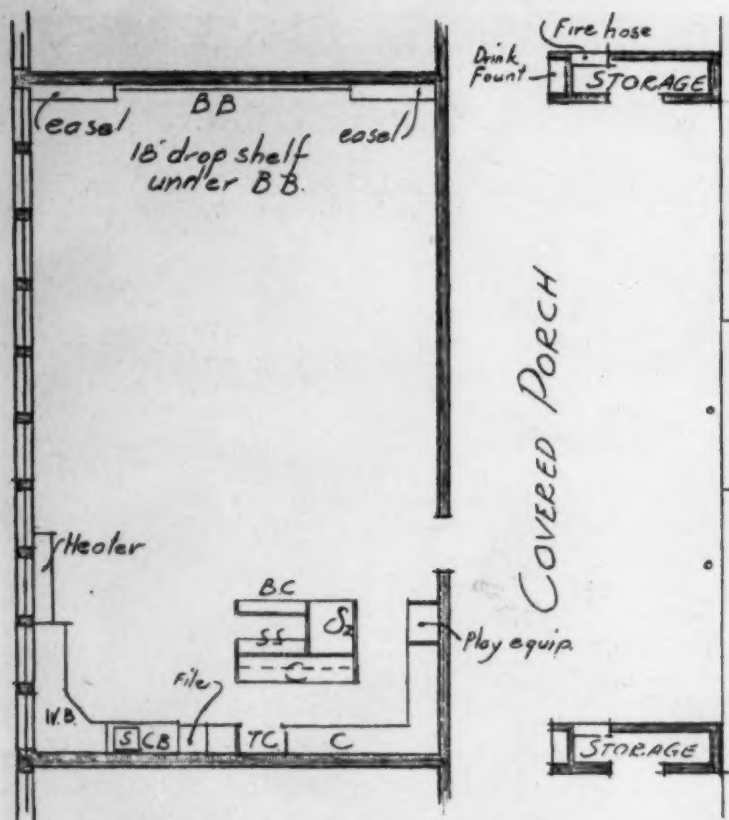
A few results of such attempts are shown here in cross section form. The sections shown are of classrooms that have been constructed and in which the lighting has been tested by competent persons and found quite superior to traditional natural classroom lighting both in levels of illumination and in reduction of brightness contrasts. These variations were developed cooperatively by local school officials, their architects, and the State Department of Education planning office staff. It

also should be mentioned that in spite of the relatively large glass areas and the very small mullions and window piers each of the buildings for which sections are shown meets all of the rigid structural requirements of the California State Division of Architecture under the earthquake safety act for school buildings.

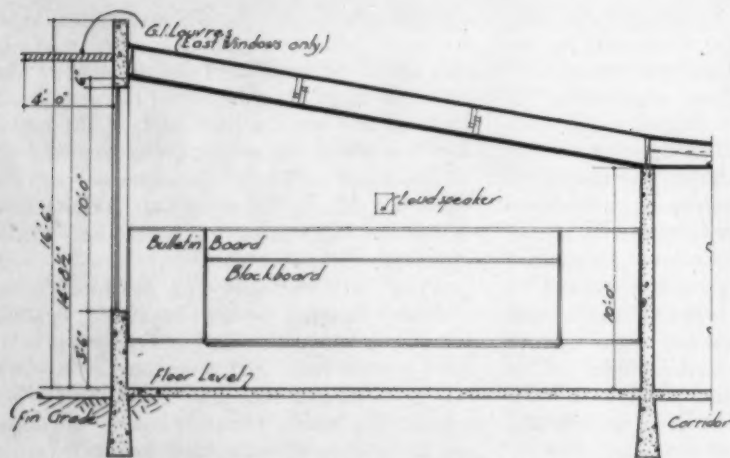
Along with the study of classroom cross sections, looking toward improved lighting has been one of direction main classroom windows should face. The more intensively this matter is studied the more convincing it becomes that north facing windows are best for classrooms. Cheerlessness in north facing



Section of a typical instructional room in the Exeter Union High School. — Franklin & Kump, Architects.



Floor Plan of Ross Elementary School, Carl F. Gromme, Architect, San Rafael, Calif.

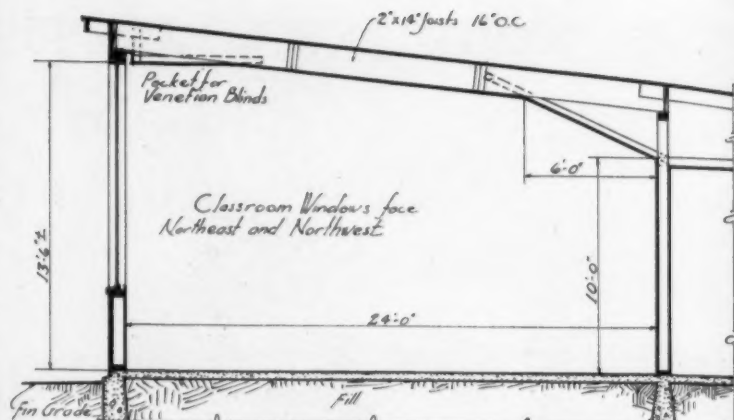


CROSS SECTION - TYPICAL CLASS ROOMS.  
OAK DALE ELEMENTARY SCHOOL.  
OAK DALE, STANISLAUS COUNTY, CALIF. FRANK MAYO, ARCHITECT.

classrooms is a myth where ample glass is provided and the room is finished in light colors. North classrooms with little or no attention to shading produce a higher level of illumination with lower brightness contrasts than can be produced with perfectly adjusted shades of the best known types for classrooms with sunny exposures. Besides a realistic view of the situation gives rise to the question: How often are classroom shades found well adjusted for even one hour of the day?

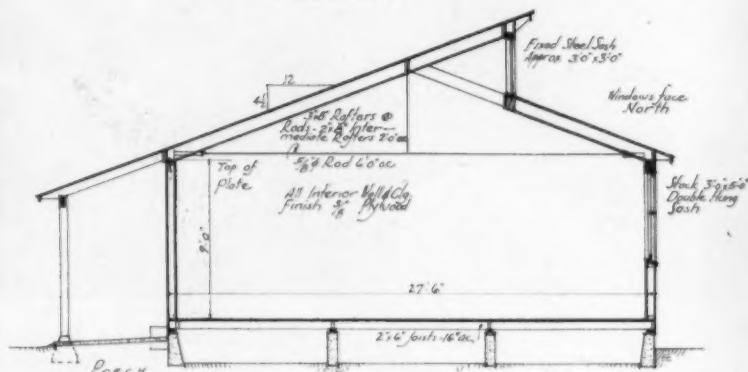
The accepted span of the traditionally planned classroom was found to interfere seriously with the sound development of work or activity type classrooms. Additional space

was first provided by lengthening the room. This process continued until a classroom length of 45 ft. was reached in one building that was exceptionally well worked out within the normal span limitation. In use these rooms were found to be too long for reasonable supervision by the teacher. Also, the teacher would have to raise her voice excessively to be heard by pupils at the opposite end of the room. To meet this objection the square type of classroom was developed and is now found in successful use in a number of school districts. The Paso Robles School, done by Frank Wynkoop, architect, is a good illustration of that type of plan. The Mon-

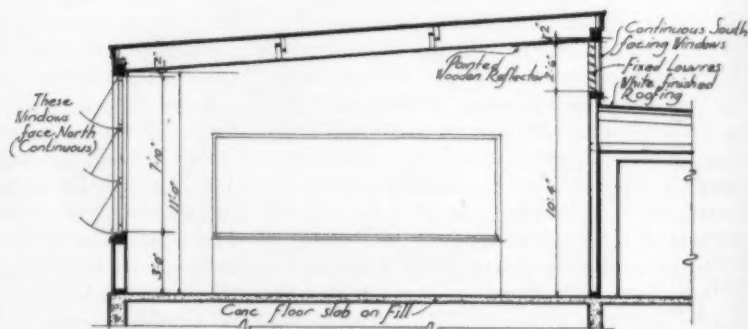


CROSS SECTION - TYPICAL CLASSROOM  
ROSS ELEMENTARY DISTRICT  
ROSS - MORIN COUNTY, CALIFORNIA.  
CARL F. GROMME, ARCHITECT.

Scale 1/4" = 1'-0"



TYPICAL CLASS ROOM  
MONTALVO MIGRATORY SCHOOL  
Scale 1/4" = 1'-0" R. S. RAYMOND, ARCHITECT



CROSS SECTION - TYPICAL CLASS ROOM  
SAN ANDREAS ELEMENTARY SCHOOL  
San Andreas, Calaveras County, California  
Scale 1/4" = 1'-0" George C. Sallan, Architect

talvo migratory classroom by R. S. Raymond, architect, shows an extremely simple and inexpensive but effective solution in the direction of square type classrooms. Any of the sections showing bilateral lighting would, with a somewhat increased span, produce excellent natural lighting by modest increases in ceiling height.

The cross section of the Exeter Union High School, Franklin and Kump, architects, illustrates the latest and I think best development of trouble free bilateral lighting by the school architects' firm most devoted to that type of natural lighting for classrooms.

(Concluded on page 67)

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# A Summary of the Demands for Increased School-Building Facilities to Meet the Needs of the Postwar Period

H. L. Smith<sup>1</sup>

From the building of the oldest schoolhouse still standing in the United States—a one-room frame built in Maine in the eighteenth century—to the construction of the magnificent stone and brick buildings of recent years, there has been, on the whole an earnest endeavor on the part of American communities to meet, in as adequate a manner as possible, the educational needs of the time—as the people conceived these needs. It is true, generally speaking, that school buildings reflect, in materials, arrangement, and architecture not only the limitations and possibilities but also the intellectual, aesthetic, and spiritual ideals of the period in which they were built.

In early colonial days in America the building needs were very few, for only a small number of youths were being educated and trained for a few specific professions. But as the idea of a more universal type of education grew, the demand for more buildings grew. As instruction methods developed from tutoring individuals to teaching of small classes, to the use of upper grade students as assistants in teaching lower grade pupils, and on to the modern classes of 30 to 35 pupils, the building program likewise developed. To handle the pupils by the Lancastrian method, large rooms were at first divided by chalk marks on the floor; then by curtains; and finally wall partitions were introduced.

Instead of, as at first, trying to accommodate the methods of teaching to a type of building, the better idea has gradually evolved of constructing the building to suit the methods of teaching.

It may be true that development in schoolhouses has been slow, but it is not true that it has lagged far behind other types of development. Most communities have kept their school buildings on a par with, or even ahead of, the average home and public building of the community. Whenever there has been a commonly felt need for improvement, that improvement has usually been made.

## Chief Causes of Changes

What causes in general bring about changes in school buildings? There are several:

1. *An increase in population.* This may result in more and larger buildings but not necessarily in improved buildings.

2. *A changing educational philosophy.* This is a fundamental cause. When there is an enlarged vision of what pupils need, what they have a right to, and what as personalities

they are capable of becoming; also, when there is a changed conception of what culture really is, then we have an expansion of the building program.

3. *Changed methods of instruction.* Examples of modifications in teaching methods are readily found. The laboratory method, the activity method, cooperative projects, etc., have called for larger rooms with different and better equipment.

4. *Buildings and building programs change as inventions and new discoveries are made,* and as new industries develop. New courses follow in the wake of new industrial developments, and call for school plant expansion with changes in types of buildings and equipment.

5. *New buildings depend on sufficient finances,* and the size of budget in turn depends upon the educational philosophy of the community and upon the actual wealth of the community. As financial ability increases, the building program expands.

6. *The building program grows as architects, plant consultants, and other specialists are better trained technically.*

All of the above causes may be in operation at the same time. In brief, it may be said that, assuming financial ability, the school-building program conforms to progressive curriculum changes; to progressive changes in methods of teaching; and to progressive changes in social ideals.

It must constantly be kept in mind that school buildings are only a means to an end. They are merely facilitation mediums for the process of human development.

The best school building is the one which is planned functionally; which translates the educational aims, methods, and ideals into an actual workable program. It is the educational program that is the real genesis for a school building; and in line with this, it is a well-defined educational policy—accepted by the community—which is the real foundation for a school-building program.

The task of the building planners is to translate the curricular and personal and social needs of the child and the community into numbers, sizes, and types of rooms; and to locate these rooms so that they will be most convenient and usable for both the pupils and the community.

Youths, like plants, to develop rightly must have the right kind of environment. According to Chinese wisdom, "If a man commits a crime his teacher should be punished." But we might say in all fairness that the school board and community leaders also should be

punished. If there is delinquency in the schools, one should look, for one of the causes, in school buildings. If they are old, and dilapidated, unsuited to needs, then the school board, community, and the state are all culpable.

A youth must learn to identify his needs and energies with those of the larger groups and learn the techniques of social cooperation. There must be actual cooperation at an actual task. Therefore, larger and more adaptable buildings are necessary to carry on such a program.

Moehlman<sup>2</sup> claims "a building has no merit when isolated from function." It also has very little merit if its builder was too visionary and the building is impractical in design and construction, or, if it is too much out of date and insufficient to meet the needs.

According to DeYoung,<sup>3</sup> "the school is the citadel of a new alliance between the government and the people's welfare" . . . but, "it is the exception to find adequate provisions for such important phases of modern offerings as community activities, recreation, adult education, medical and dental clinics, student activities, vocational subjects, music, and community, as well as school libraries."

Since there can be little question that all the causes mentioned above are at work at the present time, it is incumbent upon all educational leaders to find out what is demanded of our schools and to try to meet all reasonable demands. But even further than this, it is necessary to plan to meet the future needs of a rapidly changing social order.

There can be little question also that this National Council on Schoolhouse Construction is under special obligation not only to see today's needs in the building field but to act as a prophet and foretell what will be demanded tomorrow. It is our responsibility now to find out and to speak out concerning the building program which the schools must undertake to meet the postwar needs of the communities.

The war itself has taught us a good many valuable lessons, not the least of which is that the public schools have followed a program too narrow and too much encrusted with traditional content and methods to be able to meet quickly and efficiently the hard, stern realities of life which a country may be called upon to face at any time.

The Army and Navy by their examinations,

<sup>1</sup>An address before the annual meeting of the National Council on Schoolhouse Construction, Cincinnati, Ohio, October 15-18, 1943.

<sup>2</sup>*School Administration*, p. 40.

<sup>3</sup>*Introduction to American Education*, pp. 569 and 570, quoting from N. L. Engelhardt, and from R. V. Long.

their training programs, and by actual battles have brought into the limelight certain needs and lacks, as well as certain strong points of our American youth. One of the most fundamental of these lacks for thousands of youths is good sound physical bodies. There are far too many individuals with imperfections and weaknesses of eye, ear, nose, throat, lungs, feet, and other parts of human machinery. These physical imperfections might have been eliminated or greatly alleviated by a stronger and more expanded health and medical program.

### The Health Program

Since health is conceded to be of first importance, the health program in public schools will have to be greatly enlarged. According to United States Commissioner Studebaker, students in high school should have five hours per week of physical education and ten hours of interscholastic and intraschool activities.<sup>4</sup> This would call for a tremendous increase in facilities and equipment, both indoors and out.

An expanded health program will call for added rooms and equipment for physicians, nurses, dentists, psychologists, and psychiatrists, and also for added waiting rooms. If separate rooms cannot or need not be provided, then combination rooms may answer the purpose.

There will be two aspects to this expansion: first, an emergency expansion, or provision for immediate needs; second, a long-time program of eliminating old buildings and constructing new ones in new and adequate locations.

The daily programs in physical education will be greatly enlarged. In the elementary schools especially there will need to be an immense amount of additional facilities—no matter what the cost. We must expect to pay—and not expect something for nothing. The necessary facilities for a strong program will be somewhat as follows, with due consideration for size of schools:

#### Necessary Facilities

##### a) Outdoors:

Tennis courts, softball diamonds, football fields, track facilities, playgrounds for smaller children; good equipment for all sports

##### b) Indoors:

Swimming pools for both boys and girls in all elementary schools and high schools

Showers and adequate locker space for all

Boys' gymnasium and girls' gymnasium in all elementary and high schools

All of above fitted with modern sanitary equipment

In connection with the gymnasiums a field house for track and all sorts of indoor games

Equipment and supply rooms

In connection with the above program we shall have to face a probable fourfold expansion in gymnasium space and a tenfold expansion in locker space.

A model health unit should include:

1. An adequate waiting room

a) Accessible from outside and inside and available at all times

2. An examination room

a) Equipped for different types of examination: A vision testing room and dentist's room in connection

<sup>4</sup>Strell, W. K., "Victory Through Fitness," *American School Board Journal*, 106: 19, 63, March, 1943.

- b) Bath and toilet room
- c) Separate exit into corridor
- d) Rest rooms
3. Consultation rooms for physicians and nurses
4. A first-aid room with an adjoining waiting room
5. A psychologist's and psychiatrist's office
6. A health laboratory
  - a) Demonstration tables
  - b) Plastic models
  - c) Illustrative materials
  - d) Classroom equipment
7. Adequate rest rooms on different floors, with cots and chairs—all under supervision

In connection with the above listing of space facilities it is assumed that the principle of multiple use of rooms will be followed.

### Rural School Needs

The rural schools with their building problems are a field where wise planning and preparations for state-wide building programs are necessary at once. If it be true that "the public school stands day and night as inspiration and a tangible expression of the ideals of the American people,"<sup>5</sup> it would be well to begin a widespread movement to rebuild the old or build new schoolhouses in the rural districts.

Whether or not there be a reorganization of districts and a consolidation of schools, there must come a greatly expanded building program. If one and two-room schools remain, many buildings will have to be remodeled and modernized.

This adjustment will call for inside toilets with modern equipment. A septic tank must be built, a pump house built, and equipped with an electric pump. In many cases new windows must be provided and new electric light fixtures installed.

If rural schools are to be consolidated, then new and larger modern buildings will be required. It is in this field perhaps that the National Council should exert its best efforts and provide the most capable leadership possible. The rural field has been a long-neglected field. If we believe at all in equality of education for all the children of the United States of America, far-reaching changes must be made in the program and plant facilities of rural schools.

Rural school buildings, if they are to be at all adequate, must provide facilities for a widely diversified program. Scientific modern farming and husbandry require a knowledge of many fields. The building program must include model farm buildings in which actual farm life experience may be gained; it must include also large buildings to house modern farm equipment; it must provide workshops where machinery may be studied and repaired. It must provide greenhouses and hot beds for plant study and experiments. All these—in addition to the common essentials of a modern school, such as health rooms, gymnasiums, auditoriums; community rooms, industrial shops, and various vocational shops.

Both federal and state funds as well as local funds should be made available for the construction of these modern rural school

<sup>5</sup>Michigan Public Education Commission, "The Improvement of Public Education in Michigan," Report No. 1, p. 14.

buildings. The chief basis for this suggestion is our enlarging concept of general welfare. The good of the total population is enhanced when families go into isolated country districts and help to increase the grain and meat supply of the nation. These families should certainly be cared for educationally. The general principle back of this idea has been well stated by the Michigan Commission for the Study of Public Education,<sup>6</sup> "Education is the concern of all the people to safeguard free government; and the wealth of the State and the Nation may be used to educate the children in the several states without reference to where that wealth may be centered or where the child resides."

In the rural districts there is an impossible situation. There are thousands of districts too small to operate successfully any secondary schools. Surely we can be clever enough and provident enough to devise means by which secondary schools will be as available to every rural pupil as city secondary schools are to city pupils.

Plans should be made now for carrying out an enlarged rural school-building program. We should plan to expend almost twice as much per year in this postwar period as has been spent under normal conditions. It is desirable that the state begin early provisions for capital subventions in whole or in part including cooperation with the Federal Government's proposed postwar shelf of building projects. It is almost certain that something similar to the PWA setup will function after the war. We should have plans ready for rural schools as well as for city schools.

In connection with the making of these plans we should seek to get rid of some obsolete elements in building codes which will hamper an advanced building program. Initial codes are needed in many states, and suggestions should be prepared for these.

### City School Needs

In the city schools in the postwar years there is certain to come a demand for additional rooms with new equipment for several lines of work. Whether we vision it or not, whether we shall be prepared or not, and even whether we like it or not, the secondary schools in certain phases of their work are being relentlessly forced by circumstances into becoming a sort of apprentice shop or preparatory school for industry. Industries of many sorts are demanding young men and women with not only a good general background, but also with a good foreground—that is, a specific training for a specific type of work. These demands will doubtless mean a considerable amount of expansion, especially in the science department, in both physics and chemistry, and in the vocational department in its various divisions.

In the science field we shall have to provide additional rooms for the study of light, heat, and sound waves as a background for work in radio, radar, light and heat therapy,

<sup>6</sup>Op. cit., p. 11.

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for airplane construction and manipulation, and for many other fields, such as that of synthetics. "The science program will be characterized in part by an emphasis on competence in the use of power devices."<sup>7</sup>

It seems certain that our high schools will have to face more definitely and realistically the fact that there are increasing demands for a much more diversified and more practical vocational training.

The NYA program, while it was undoubtedly unsuccessful in much of its work, nevertheless demonstrated one thing very clearly: That it is possible successfully to integrate work experience with the educational process, and that this can be done on a nationwide scale. We shall have to expand along this line: "Work and study," or "practice and theory."

This integration of work and instruction necessarily calls for greatly enlarged facilities for actual work. Students must be trained on real machines, or in using real tools at real tasks.

"Increasing urbanization and industrialization have made it impossible for large numbers of youths to receive the work experience formerly given them by the home and the community. The school is the only agency that can supply this necessary element of education."<sup>8</sup>

In connection with the vocational program there will be an increasing demand for the following rooms, shops, or space facilities for such on a multiple use basis:

1. Woodwork shop
2. Machine shop
3. Automotive shop and garage
4. Agriculture experiment shop
5. Domestic science rooms
  - a) Cooking
  - b) Dining room
  - c) Sewing
  - d) Storage
6. Public utility shops
  - a) Electricity
  - b) Gas
  - c) Water
7. Plumbing shop
8. General repair shop
9. Airplane shop
10. Radio shop
11. Greenhouse

#### Library Needs

Another field which calls for expansion of rooms and facilities is that of library service. Most school libraries are too small, not well located, and lack in equipment and arrangement. Postwar plans should call for enlarged quarters, and extended service.

The library should be centrally located, and in large schools should have branches in the different departments. It should, if possible, be convenient to the social science and English departments, for the subjects taught there are living subjects—such as current events, dramatics, speech, commercial English, and journalism. The library should be their laboratory. It should have fluorescent light, comfortable chairs, a stage, a fireplace, and should be artistically furnished. It should, if

possible, be accessible from the outside, as a convenience to the community.

The term library service is well chosen, for more and more the library is becoming a center of service for all the different school departments. Upon this center all the teachers draw for supplies and aids and reading matter. Maps, charts, pictures, audio-visual aids of all sorts are constantly on call.

As the service extends, the necessity for more rooms becomes greater. And as service increases, appreciation grows and the tendency increases to allow more space to library work.

A modern well-equipped library in a large high school, for example, will call for the following rooms:<sup>9</sup>

1. A large general reading room, to seat one third the enrollment
2. Branch libraries in the different school departments
3. A faculty reading room
4. A classroom in connection with the main room
5. Conference rooms—two or more, according to size of school
6. A workroom
7. A storage room
8. Sound equipped room
9. A laboratory for materials and experiments
10. A periodical and pamphlet reading room
11. A well-equipped office

#### Vocational and Business School Expansion

In the business and commercial fields significant changes are certain. Curricular offerings will be greatly increased, and there will be changes also in areas of emphasis. The training will be much more definitely vocational and will require more specialized rooms and equipment.

Several fields of expansion may be noted: The students dropping out of high school now—juniors and seniors who will come back to finish their high school training—together with graduates who, returning from the army, will want additional training, will constitute quite a large group to be taken care of in addition to the usual number enrolled; there will be also a great deal of work in rehabilitation, both of industrial workers and of members of the military forces; the demands upon the vocational departments of high schools will be greatly increased through the influence of returning soldiers, sailors, marines, airmen, and warworkers who have seen and realized the advantages of having one or more definite skills; there is a tendency, also, in the business field to train students in an occupational area rather than for a specific office job. This trend will call for additional instructors, rooms, and equipment because students will learn to manipulate several kinds of machines and do various kinds of work instead of one; finally, in the business field there is a growing demand for adult education on the high school level. High schools will be called upon to expand their offerings and facilities to meet this demand.

In the field of high school training for industrial jobs there is a special factor which may affect the building program. At the pres-

ent time there is a large quantity of equipment furnished by the government to high schools and to certain NYA centers, now available for use in high school shops. Since this equipment is available, why not plan to build shops and take advantage of the opportunity to get the equipment either free or at a very small cost?

One may, however, see two or three possible checks on an immediate expansion in the high school facilities for vocational training. One of these is the fact that after the war we shall have thousands of young returning members of the armed forces fully trained in many lines of industrial work—and anxious to go to work immediately. For a few years might there be an oversupply of skilled workers which would eliminate the necessity for many high school training shops? Many, also, of these returning will be trained instructors who can step into high school positions and thus lessen very materially the need for teacher-training classes in the colleges.

Another possibility which may lessen the need for an increased building program in smaller high schools is that of providing area trade schools available to seniors or post-graduates of high schools. These area trade schools could offer many more courses and classes in shopwork and be more flexible than the high schools.

On the other hand, a feature which will certainly call for an enlarged curriculum, and to some extent an increase in classroom facilities, is that of providing, in connection with the different types of vocational training, a special course in human relationships applicable to the particular field. It has been ascertained from research in different industries and vocations that the lack of skill or training is not the only cause of failures but that lack of ability to make social adjustments so as to fit into the group, and thus be satisfied and enjoy the work, contributes largely to such failures.

#### Music School Expansion

Another large area in which there is certain to be a postwar expansion is the field of music. In both the elementary and high schools, music is destined to play a larger role in the future. This development will be the natural result of a changing philosophy of education. We are arriving at a broader conception of the essentials of culture. We are realizing that freedom of the spirit is a *sine qua non* of physical freedom; and that music is an ally of happiness and morale. As this realization grows, music will be given more time and more accommodations. There will be more class singing, more special choral singing, more orchestras and bands.

Because of an increased public knowledge of and demand for music, there will also be an increased demand for trained musicians for radio work and for instructors. All these factors will enter into a demand and need for increased facilities.

The trend in music buildings is toward having a separate building or a separate wing,

<sup>7</sup>Loud, O. S., "Science in the New School," *Educational Method*, 22: 217-23, February, 1943.

<sup>8</sup>Swerdlow, Irving, "The NYA: Its Valuable Lessons," *School Board Journal*, 107: 19-20, September, 1943.

<sup>9</sup>In presenting this ideal setup to the public or to school boards, it might be well to give the areas of these rooms in terms of square feet.

so that other departments may not be disturbed. An adequate setup for the average high school is somewhat as follows: A general room for practice for band and orchestra, large enough for ninety performers; in this room there should be circular platforms 5 feet wide, with 8-inch risers. There should be 9 square feet of floor space and 200 to 250 cubic feet of air space for each performer. This general room should have easy access to the stage of the general auditorium. In many cases it might well be underneath the stage—a space often not utilized.

In addition to the general rehearsal room there should be a separate chorus room (in large high schools); a theory and appreciation room; a library room; an instrument storage room with lockers; a director's office; several small rooms for individual practice, the number varying according to size of school. All practice rooms should be acoustically treated and soundproofed.

#### Expansion in Adult Education

In the field of adult education there will be in all probability an increasing demand for facilities to take care of additional classes and various groups of the communities. More and more the people of a community are making use of the local school buildings as a

center for further education and for group gatherings. This is true both in urban and in rural districts. School buildings which have neither a community room nor facilities for group work will probably have to be remodeled or added to in order to meet this need. In all probability there will be an increased demand for continuation centers both for high school and college work. In most cases there will not be the necessity for a separate building but if a project, such as is under way in Denver, should be carried out in other communities there would be need for new buildings.

I have reviewed very briefly the picture, as I see it, of the demands for building expansion in several different fields. Naturally enough, those who are interested in other subjects and activities in the education field can in all truthfulness say that expansion is certain in every phase of the work, because new methods are developing and science is continually presenting us with new discoveries, but the fields which we have mentioned are perhaps enough to show that there will be, in the postwar period, a very considerable demand for an enlarged program in school-house construction.

This whole situation in connection with future expansion calls for a serious considera-

tion of such questions as "What is absolutely essential in the building program? What may be recommended as a minimum standard?" and, "What may be recommended as desirable?" Perhaps we should consider seriously whether we stress sufficiently the desirable in school buildings. Perhaps we should ask whether we have been inclined too much to set low standards which all may reach rather than to recommend desirable standards which the great majority could and ought to reach.

There is a question as to whether we should set standards on the basis of cost, recommending only those things which the poorest districts can afford, or set standards with the highest welfare of pupils as the criterion, recommending what many can afford and what is desirable for all districts.

In planning for the future, as one sees the increasing demands he should not allow himself to become visionary or impetuous and to advocate radical measures. Even to meet the urgent needs of the next few years, any conservative estimate will be radical in the judgment of many. The important thing is that schoolmen and communities face the realities, appraise carefully the various demands, and then go forward with sound plans and a well-integrated program.

## Planning and Equipping the High School Library William M. Coman<sup>1</sup>

In many respects the library is the cultural heart of the secondary school. It is a treasury for the priceless heritage of knowledge from the past. As such, it should be the most pleasant room in the school—a workshop with a cheerful atmosphere of quiet dignity. Boys and girls should look to it as a delightful place for study or for recreational reading in leisure moments. To produce a beautiful room in harmony with this spirit, equipment must blend utilitarian aspects with those of the aesthetic.

#### Some General Considerations

The school library should be centrally located in commodious quarters, preferably near the English and social studies classrooms. The main room is usually about twice as long as it is wide, and should seat at least 6 per cent of the total student body. Good lighting, whether natural or artificial, is essential to the formation of good study habits. For the proper control of natural light, windows should be equipped with Venetian blinds. Walls should be tinted a light color with the ceiling lighter than the walls, if possible. Buff walls with a cream ceiling is a good combination. Woodwork and trim must be planned to

harmonize with the finish of library equipment selected.

Distracting noises may be reduced to a minimum through the use of acoustical plaster on walls and ceiling, and linoleum or cork tile on the floor. Silent glides on the chairs will be found helpful.

Equipment constructed of oak is the generally accepted standard for school libraries. Properly finished wood has a richness and beauty of texture which cannot be equaled in steel. Hand rubbed varnish is usually superior to lacquer in both appearance and durability. Light or dark finish is a matter of taste. In situations where there is strong light, however, dark finished oak will be more restful than the light finish.

Standard sectional library equipment is cheaper and better, in the long run, than equipment built by the contractor or manufactured in a local cabinet shop. Furthermore, it is always possible to secure additional units of standard sectional equipment which will match and intermember with existing installations. It is also possible to rearrange standard sectional equipment without loss.

#### The Reading Room

For the average school having a prospective enrollment of 1200 to 1600, the reading room should be planned to seat at least 90 students

at tables, thus accommodating two ordinary classrooms.

Rectangular tables are more economical of space than round tables. However, students should not be seated regularly at the ends of tables 36 in. wide, since interference occurs which may lead to disciplinary problems. In general the 3 by 7-ft. 6-in. table, which seats six students, presents a better appearance than the 3 by 5-ft. table which seats four. If the width of the room permits, two rows of 3 by 10-ft. tables may be the best arrangement.

Library chairs should be of simple design, with reinforced construction and solid saddle seat.

Junior high school reading rooms need not necessarily be equipped with two heights of tables and chairs. Experience has shown that most of the smaller children prefer to use standard 18-in. chairs at 30-in. tables, whereas the larger boys like to sprawl over a 16-in. chair at a 26-in. table. A number of junior high school libraries, completely equipped with 18-in. chairs and 30-in. tables, have presented no problem and it is probably safe to assume that full-sized equipment will be satisfactory in all normal situations.

#### Library Shelving

Shelving should be planned to accommodate the maximum number of volumes without re-

<sup>1</sup>Supervisor, Business Division, Los Angeles Public Schools, Los Angeles, Calif.

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sorting to the use of free-standing double-faced floor stacks. Floor stacks occupy space needed for tables and create little hide-outs which add to a librarian's troubles.

Standard sectional wall bookcases, seven shelves high, may be used for both junior and senior high schools. For accessibility to all shelves, several stools 12 in. high with hand-hole in the top must be provided. Low shelving, five shelves high, is better adapted to the needs of junior high school students, but the book capacity of the library is limited thereby. Many schools having low shelving as initial equipment have found after a few years that it was necessary to raise their shelving to full height. The only alternative is floor stacks. Architects can increase the book capacity by designing the building so that the windows on the outside wall are high enough to permit the use of standard low shelving beneath them. The panels between the windows may be used for pictures.

An excellent arrangement provides for stacking general circulation books along two sides of the room in cases 8 in. deep, and for shelving reference volumes and bound magazines at the ends of the room in cases 10 in. deep. Shelving 12 in. deep is rarely needed in the school library. A bookcase with glass doors to lock should be included in the shelving near the charging desk. The newspaper rack with ten holders can be conveniently located in a section of shelving at the rear of the room where the rustling of pages will be least objectionable. If desired, a section with flat or sloping shelves for magazines may be



Corner in a Los Angeles Junior High School library illustrating particularly the type of furniture used and the arrangement of bookshelves and wall display areas.

included in the shelving plan, but most librarians prefer the free-standing magazine rack.

#### The Charging Desk

The charging desk should be of the standard wing type, standing height, with sunken charging compartment, cash drawer, cupboards, and shelving. It should be located at the end of the reading room adjacent to the librarian's office. This provides adequate administrative control of the library and saves the librarian many weary miles of walking.

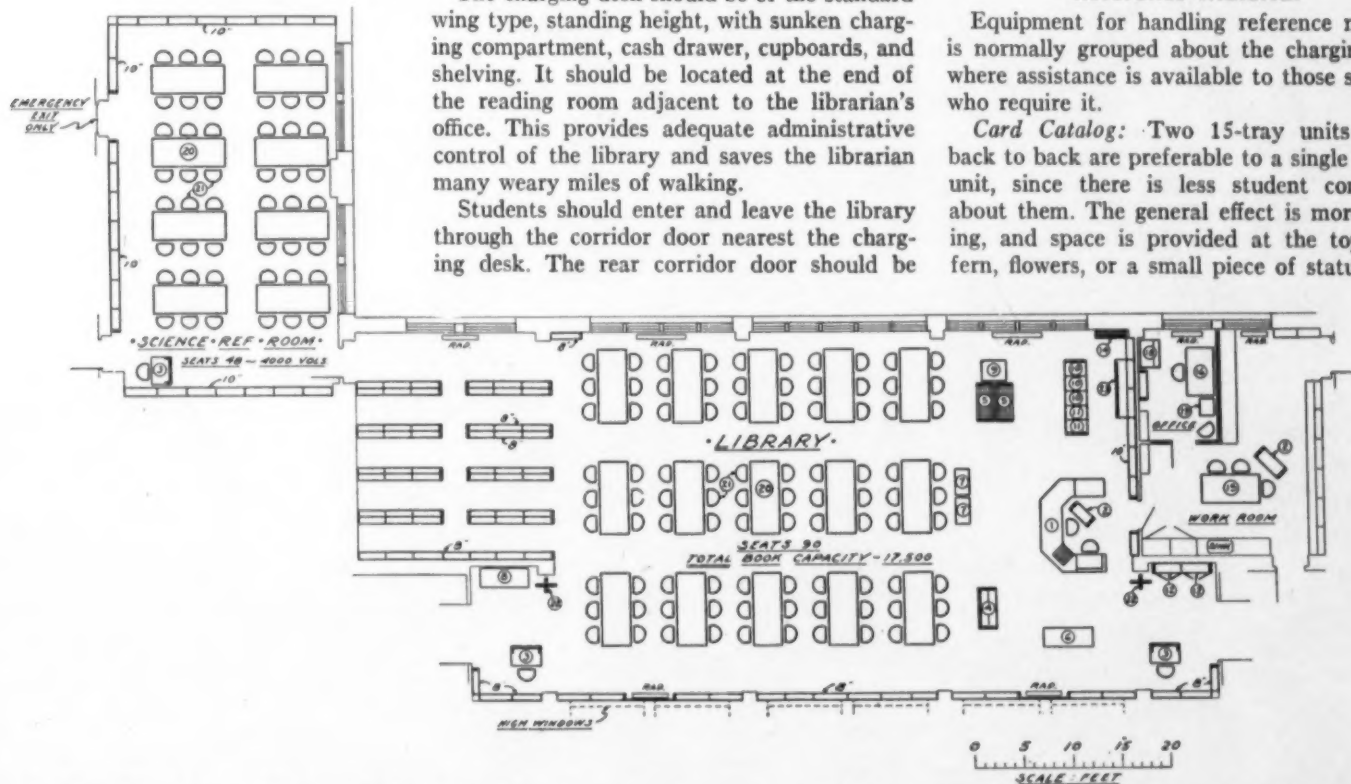
Students should enter and leave the library through the corridor door nearest the charging desk. The rear corridor door should be

used as an emergency exit only. Consistent use of this plan will prevent the loss of many books.

#### Reference Material

Equipment for handling reference material is normally grouped about the charging desk where assistance is available to those students who require it.

**Card Catalog:** Two 15-tray units placed back to back are preferable to a single 30-tray unit, since there is less student congestion about them. The general effect is more pleasing, and space is provided at the top for a fern, flowers, or a small piece of statuary.



Equipment Layout for Senior High School Library, Showing Use of Alcove for Stacks and Reference Room.

- Key to Equipment:**
1. Charging desk and chair
  2. Book truck
  3. Student assistant's table
  4. New book display

5. Magazine rack
6. Exhibit case
7. Card catalog
8. Readers' guide table
9. Atlas case

10. Picture file
11. Pamphlet file
12. Glass door bookcase
13. Heating & ventilating grille
14. Newspaper rack

15. Worktable
16. Flat-top desk
17. Readers' guide table
18. Sectional office file
19. Typewriter table

20. Library tables
21. Library chairs
22. Bulletin board
23. Sloping reference shelf

**Reader's Guide:** A small table having a top approximately 2 by 3 ft., with book rails at the ends and across the back, will serve the purpose. A similar table may be used for the student assistant who checks out books at the door.

**Picture and Pamphlet Files:** A picture file usually consists of three large drawers, each approximately 12½ in. high, 15¼ in. wide, and 24 in. deep inside, with one drawer above divided into three compartments for 3 by 5-in. cards. The pamphlet file consists of four legal size drawers. Each large drawer may be fitted with a "flexi-file" of 12 compartments, if desired. These filing cabinets intermember, permitting expansions as the collections grow. For the new library, two picture files and one pamphlet file will be sufficient.

**Magazine Rack:** This should be of the free-standing floor type, capacity 35 magazines, equipped with adjustable steel holders which display magazines of various sizes in a neat and attractive manner.

**New Book Display:** A rack for displaying new acquisitions or special study sets, with a bulletin board above for posting jackets, travel pictures, etc., is an invaluable addition to any library. Such displays fire the imagination of the student and promote independent reading in new fields of interest. The rack is about the same size as the magazine rack and pairs well with it, back to back, as a floor unit.

**Atlas Case:** A case with sloping top and pull-out shelves is necessary for handling large atlases.

**Exhibit Case:** A large floor case with plate glass on the four sides and top, and a plate glass shelf, can be very useful for tying the library into the activities of the whole school. Such displays should be changed once each week, if possible. Typical exhibits include:

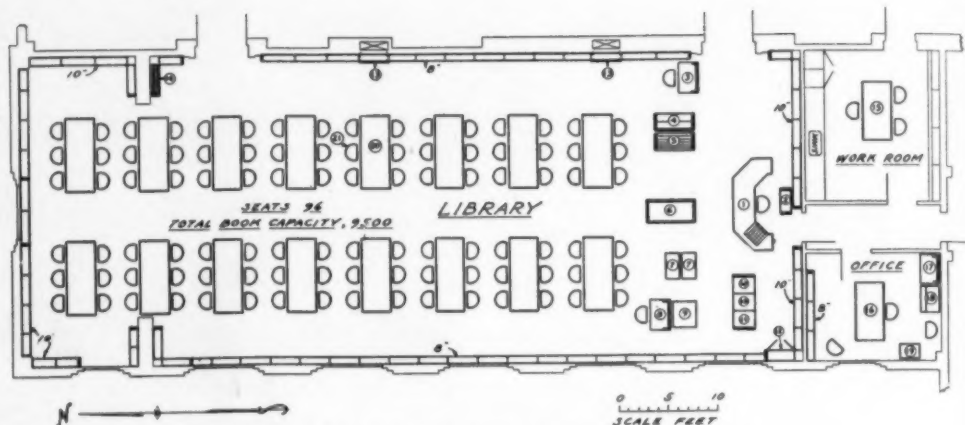
Interesting old manuscripts or early editions  
Butterflies from the science department  
Stamps from the stamp club  
Local wild flowers  
Drawings from the art department  
Stitchery or weaving from the home-economics department  
Projects from the shops

A case 28 by 60 in., height 42 in., with 14-in. adjustable plate glass shelf, is not too large.

**Bulletin Boards:** Every library needs colorful bulletin boards. These may be of the hinged type attached to the face of shelving at each side of the entrance door, or may be permanently fastened to the wall above radiators, etc. The free-standing floor type is not recommended for general school use.

#### The Librarian's Office

The librarian's office should adjoin both the main reading room and the library workroom. Office equipment should include a double-pedestal flat-top desk, a steel typewriter table mounted on large casters, a sectional office file, three or four sections of wall shelving, and a noiseless typewriter equipped with the necessary attachments for handling cards. Where space permits, a standard typist's desk



Equipment Layout for Junior High School Library.

#### Key to Equipment:

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|------------------------------|----------------------------------|---------------------------|
| 1. Charging desk and chair   | 7. Card catalog                  | 15. Worktable             |
| 2. Book truck                | 8. Readers' guide table          | 16. Flat-top desk         |
| 3. Student assistant's table | 9. Atlas case                    | 17. Readers' guide table  |
| 4. New book display          | 10. Picture file                 | 18. Sectional office file |
| 5. Magazine rack             | 11. Pamphlet file                | 19. Typewriter table      |
| 6. Exhibit case              | 12. Glass door bookcase          | 20. Library tables        |
|                              | 13. Heating & ventilating grille | 21. Library chairs        |
|                              | 14. Newspaper rack               |                           |

may be substituted for the typewriter table. The sectional office file may consist of a standard five or ten-tray card catalog unit for 3 by 5-in. cards, two legal size drawers, cornice top and leg base.

#### The Library Workroom

The library workroom must have running water, a sink, and ample cupboard space. Movable equipment should include chairs, one or two book trucks, and a specially built library worktable. A splendid worktable, designed by a Los Angeles junior high school librarian, consists of a linoleum top table 3 by 6 ft., height 32 in., with large shallow drawers at one end and deep drawers at the other. Knee space is provided at the center.

A book chute from the corridor has been of value to many schools. It permits the return of overnight books before the library is open, and facilitates the return of overdue or stolen books which might not be recovered otherwise.

Sets of books for classroom use may be distributed easily by means of an inexpensive book-trough carrier, 24 in. long, with a handle extending the full length at the top. In one delivery two students can handle a complete set of reference volumes. Since the books remain in the carrier until returned, the workroom should be supplied with a carrier for each set in circulation.

#### Equipment Layout

Before purchasing equipment for a school library, a scale drawing must be made which shows the exact position of each piece of equipment and of each section of shelving. This step is absolutely necessary to successful planning. If unfamiliar with the technique of such drawings, the assistance of your nearest "library bureau" representative is yours for the asking.

The accompanying layout has been made for a new junior high school which is expected to open with an enrollment of 1200 students. The reading room is designed to seat 96 students at tables, and has a shelf capacity of

9500 volumes. The estimated cost of equipment is \$4,200. Note the shelving beneath the windows.

Skillful planning is necessary to make the school library functional as well as beautiful.

#### PUGET SOUND

##### POSTWAR SCHOOL-BUILDING PROGRAM

Extensive school-building construction is proposed for the reorganized school districts of the state of Washington located in the Puget Sound Region. The recommendations are made by the Puget Sound Regional Planning Commission and the Washington State Planning Council, who have worked in cooperation with the National Resources Planning Board. In a report just issued by the last mentioned organization the details of the school program are made public. Because of the district reorganization action, under the new Washington State School Reorganization Law, it has now been found possible to set up financial budgets, including expenditures for new school buildings, and to stay within constitutional tax limits.

The school-building program, which has been proposed, includes buildings for the various grades from elementary through junior college, and in some cases, special facilities such as vocational schools.

The estimated cost of school-building construction for the region, including state educational institutions, is \$30,350,000. For common school-building construction alone, this represents the equivalent of a 5-mill annual tax levy for a five-year period, based upon 1942 assessed valuation; for construction at state educational institutions, a 3-mill levy for the five-year period, based upon state valuation.

The program, as set up, will bring to fruition the full benefits of reorganization plans. The program will repeat itself after the five-year period if it is indicated that greater needs exist because of an increase in population not at present contemplated. An adequate present and postwar planning program, it is contemplated, will lead to the establishment of sound and continuing state-wide policies and practices in the field of common school-building finance, design, and construction.

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# The Planning of Vocational Departments in High Schools

Maximillian Komow<sup>1</sup>

Our entrance into World War I in 1917 found us in an extremely embarrassing situation when the government called upon industry to produce large quantities of munitions and other necessities for ourselves and our allies. The existing supply of skilled labor was insufficient to meet these suddenly increased demands. Vocational education was still largely in its infancy and our industrial plants were manned almost entirely by foreigners. A fully skilled American craftsman was a rarity; most of the first-class mechanics were of German, Swiss, Scandinavian, and French nationality.

Our public school systems were caught flat footed in that emergency, and the government was compelled to subsidize private trade schools to insure a quickly trained supply of skilled labor. Fortunately for us, our genius for designing and building automatic machinery saved the day. Skilled labor was used to build this equipment which needed only our hastily trained mechanics to operate it.

The realization of our shortcomings of that period imparted tremendous impetus to the extension of vocational training so that when World War II dawned upon us the schools were ready to meet the new crisis. Communities which 25 years before had no provisions whatever for vocational training, let alone industrial-arts training, were this time well equipped to meet the emergency. The larger cities which had only one or two vocational schools now had ten times as many.

The smaller communities, whose school populations were insufficient to warrant the organization of special schools for vocational training, established vocational departments in their high schools. These schools have been the backbone of vocational education in our country, and their efforts toward meeting the requirements of industry have merited universal praise.

The demand for vocational training has increased by leaps and bounds. The pace has been so rapid that our schools have been unable to keep up with it. Unfortunately, the present shortage of building materials and shop equipment has resulted in a complete cessation of school construction, but many communities are now at work on plans for new school buildings to be constructed during the postwar period. Vocational training is receiving major consideration in many of these plans.

The planning of a general high school with a vocational department sometimes presents more difficult problems than that of a vocational high school, for, when the limited school population requires only a few shops, it is



A typical machine shop in the East New York Vocational High School. Mr. Eric Kebbon, architect of the Board of Education.

difficult to determine which shops to select.

It is necessary to base such planning on the following presumptions:

1. The pupil should receive three hours of shop instruction per day. This means that it will be possible to accommodate only two groups of pupils per day in each shop. If an overlapping double-session program is planned, then three groups of pupils may be accommodated in each shop.

2. The capacity of each shop should be no greater than 25. When this number is exceeded, the instructional efficiency of the teacher is very much impaired, and where much power equipment exists, the possibility of accidents is greatly increased. Many authorities are of the opinion that the capacity should be limited to 15. In fact, schools which are operating a war-training program limit their classes to 10.

## Number of Shops

It is therefore evident that a shop can accommodate a maximum of 50 pupils per day on a single session program and 75 on an overlapping double session program. To determine the number of shops for which provision must be made we divide the total number of pupils available for vocational training by either 50 or 75, depending on the type of proposed program.

## Selection of Shop Subjects

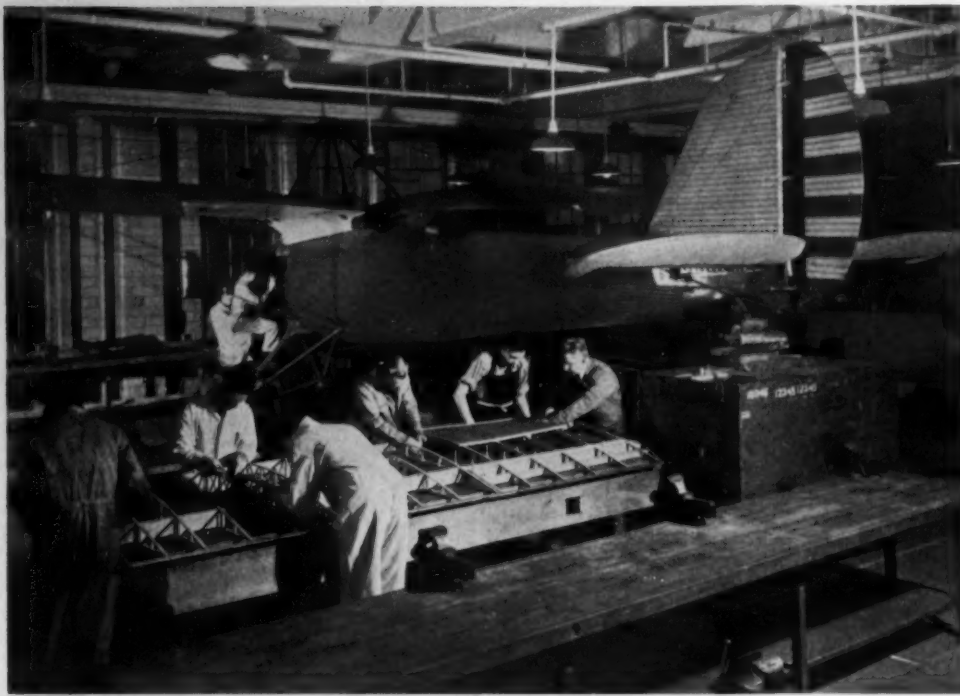
Having fixed the number of shops for which provisions are to be made, the next question to be settled is the types of activities to be taught. If there are any large industrial establishments within or accessible to the community, the needs of these establishments may determine the nature of the shops. The tendency in such cases is to train for specific skills. Many schoolmen are opposed to such training, since it limits the field of the worker to certain narrow jobs and thus makes it difficult for him to obtain work in allied fields when unemployment occurs in his own trade. This type of training also tends to reduce the possibilities of advancement of the worker. We therefore prefer to provide training of a broader and more general character.

Where local industries do not exist or their specific needs are not to be considered, the general type of shop should be provided. The selection of subjects will depend on the number of shops to be installed.

## The One-Shop School

Some schools will find that one shop is ample for their requirements. In such a case it will be necessary to introduce the greatest possible variety of activities. Facilities may

<sup>1</sup>Bureau of Vocational Activities, New York City Schools.



The airplane shop in the Brooklyn, N. Y., Technical High School.  
Mr. Eric Kebbon, Architect.

be provided for instruction in carpentry, cabinetmaking, wood patternmaking, sheet-metal work, machine-shop practice, elementary foundry practice, electrical trades, automotive mechanics, and aviation mechanics. Of course, where the activities are so varied they must, because of physical limitations, be equipped on an extremely elementary level. One of the problems involved in this type of shop is the difficulty of finding an instructor with sufficient practical experience to teach such a variety of subjects on a trade level. Such persons are usually obtained from industrial-arts teacher-training schools, but their shop training is of a superficial character, not very well suited for vocational training.

#### The Two-Shop School

If the school population is sufficiently large to require two shops, it is possible to break the curriculum down into two general subjects, namely wood and metal. The woodshop will provide instruction in carpentry, cabinetmaking, wood patternmaking, and the wing and fuselage portion of aviation mechanics. The metal shop should be equipped for sheet-metal work, machine-shop practice, elementary foundry practice, electrical trades, automotive mechanics, and aviation engine mechanics. The instructor problem is not quite so acute here as in the case of the one-shop school, but we will still be compelled to recruit teachers from the industrial-arts teacher-training schools.

The three-shop school should have the two previously mentioned shops and, in addition, a graphic arts shop. In this last mentioned, shop equipment should be provided for printing, offset work, bookbinding, silk-screen work, and etching.

#### The Three-Shop and Multi-Shop Schools

These three shops, the woodshop, the metal shop, and the graphic arts shop contain practically all of the curricular elements of a general vocational high school. As the number of shops increases it becomes possible to separate each of these three shops into unit activity shops. Carried to its ultimate conclusion it is possible to have as many as 15 shops. The number can be further increased by breaking down each unit into smaller components. A good example of these possibilities is automotive mechanics, which, in some schools has been separated into six activities; namely, engine shop, chassis shop, front- and rear-end shop, lighting and igni-

tion shop, body- and fender-repair shop, and general repair shop. Further variety is possible by introducing provisions for the building trades and the textile and garment trades.

#### Shops for Girls

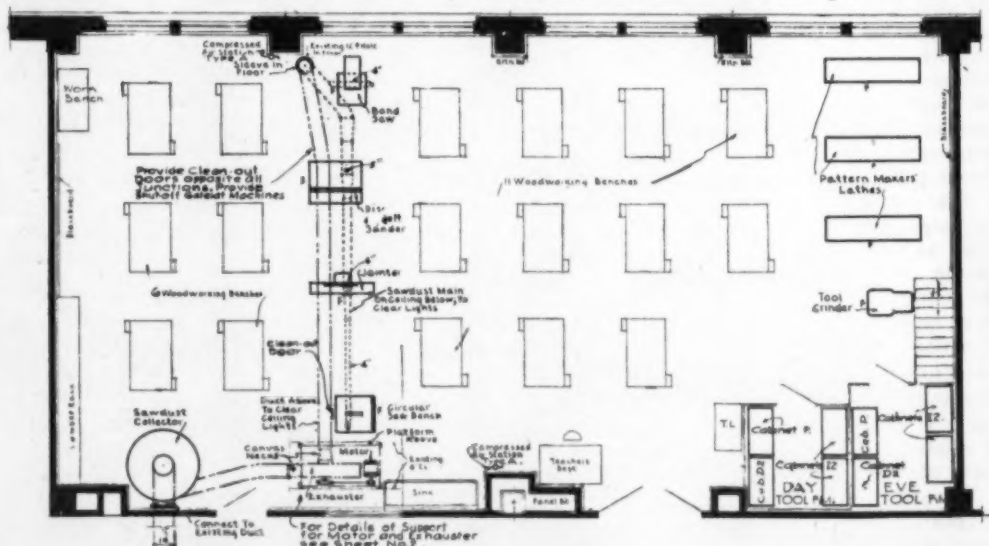
The discussion has heretofore been restricted to shops for boys. However, some communities may also be interested in vocational training for girls. Opportunities for employment for girls are usually found in household work, the textile and garment trades, the service trades and commercial work. Each of these is susceptible to considerable subdivision to meet the peculiar requirements of each community.

Having agreed on the number and types of shops, it now becomes necessary to give consideration to their physical planning. It will not be possible within the brief confines of this article to give adequate treatment to this subject, but there are several "musts" without which good shop planning will be unsuccessful.

#### Location of the Shop

First consideration must be given, of course, to the location of the shop. It has been the habit of some school architects to relegate the shops to the basement of the building. This is bad practice if the floor of the basement is below the level of the school grounds, for it is then not possible to provide adequate daylight. Furthermore, it is difficult to render basements completely dampproof. The health of the students is thereby endangered, and the life of the shop equipment is shortened. Shops should generally be located where an adequate supply of daylight is available and where the noises emanating from the activities will not interfere with the instruction in academic and other rooms. However, certain shops, which by the nature of their activities require frequent access to the outside, should be located on the ground floor, with large doors opening directly to the street or courtyard.

The activities of some shops result in the



Woodworking and Pattern Shop, East New York Vocational School,  
Eric Kebbon, Architect. The room measures 28 by 57 feet.

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emission of noxious gases and unpleasant odors which can usually be eliminated by a properly planned ventilating system. Some architects prefer to insure the elimination of these nuisances by locating such shops on the top floor of the school building.

### Dimensions and Proportions of the Shop

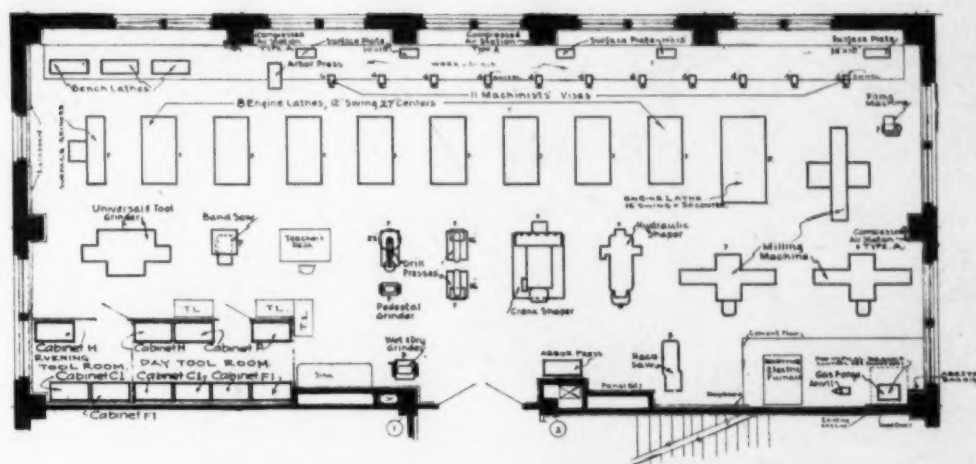
The next consideration should be given to the dimensions and proportions of the shop. No shop should be any larger than is absolutely necessary to adequately and safely house the students, equipment and tools, and storage facilities, since the larger the shop, the greater the disciplinary problems of the instructor. For the same reason, the length of the shop should never be greater than twice the width, after deducting tool and storeroom space. In order to insure satisfactory daylight to all parts of the shop, the ceiling height should be no less than half the distance between the window wall and the opposite wall.

Experience indicates that the smallest area for boys' shops should be 1300 square feet. Girls' shops require a minimum area of 1000 square feet. These areas are approximate and may be varied slightly. Many shops require much more space than the minimums stated. The area of the shop is, of course, regulated by the amount of space taken up by the equipment. It is quite evident that an automotive shop or an aviation shop will require much more space than an electrical shop.

Irregularly shaped rooms should be avoided because these usually create nooks which place some of the students out of the range of vision of the teacher. For the same reason toolrooms and storerooms should be located at the ends of rooms.

### Selection of Equipment

In the past, shops in high schools have been designed principally for instruction in the industrial arts, and the equipment in these shops has been selected with that purpose in view. Vocational training shops differ from industrial-arts shops in that they are designed to train young people directly for work in industry. The equipment of these shops should, therefore, be similar to the latest and best types which the students will



The Advanced Machine Shop in the East New York Vocational High School measures 28 by 70 feet. Eric Kebbon, Architect.

find in industry. However, the machines need not be as large as those used in industry, for the accessories of these large machines are often too heavy to be safely handled by the students.

The question as to what equipment should be installed in a school shop seems to disturb many school designers, as is evident from an inspection of some of their shop plans. They will avoid this perplexing difficulty if they bear one rule in mind, namely, that a shop layout should be based on the course of study of the subject for which the shop is to be designed. An analysis of this course of study will indicate what equipment is needed. It will also determine how many of each type of equipment is required.

### Aisles and Pupils' Working Spaces

The equipment of a school shop should be laid out in regular, parallel lines. This arrangement will create regular and parallel aisles which will make possible the safe and rapid dismissal of pupils.

Aisles which do not include pupils' working spaces should be at least 3 feet wide. If they include working space for one line of pupils, they should have a minimum width of 4 feet. Aisles which include working space for two lines of pupils working back to back should be at least 5 feet wide. Main aisles should never be less than 4 feet wide. In

general, each student should have sufficient free space around him to permit him to carry on his work without accidental interference from passers-by.

### Tool and Storerooms

The storage of tools and supplies usually receives little consideration in the planning of school shops. Rarely indeed does one find these facilities adequately and efficiently planned. Usually the storage of finished work receives no attention at all. It is always better to err on the side of too much space for these purposes rather than too little.

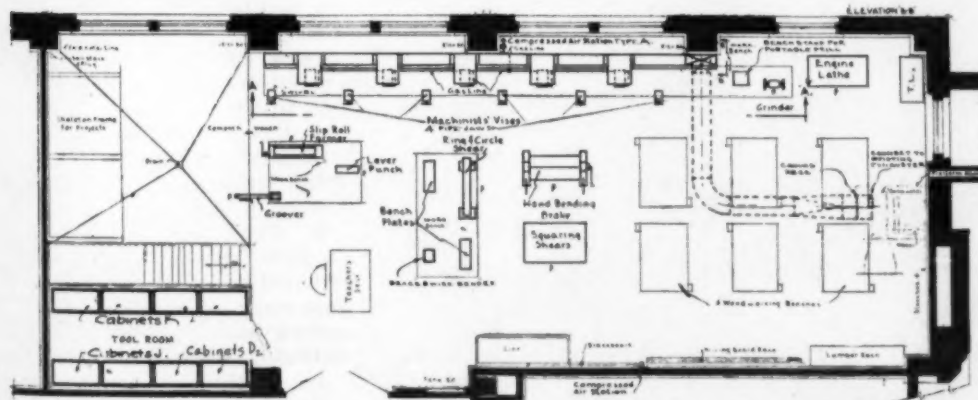
The types of tools, supplies, and pupils' projects should determine the arrangement of cabinets, shelves, and panels in these rooms. Therefore, not only will the sizes of these rooms vary in the different shops, but also the storage facilities within these rooms.

### Pupils' Seats in Shops

The conditions under which pupils will be required to work in industry should determine whether or not seats should be provided for them in school shops. If the nature of the work requires a standing position, then the pupil should learn to work in that position and no seats should be provided. If the converse is true, then seats are needed. However, care should be exercised in planning the shop, so that these seats do not become a hazard in the case of an emergency requiring a rapid dismissal.

Some shop instructors favor the inclusion within the shop of a group of seats which the pupils may occupy during a lecture or quiz lesson, but supervisors oppose this practice on the ground that it has a tendency to encourage the instructor to conduct unnecessarily long oral and written lessons. Experience indicates that the average shop student is unable to assimilate any portion of a lesson which occurs after the first 15 or 20 minutes. It is not too much to expect of a student to require him to stand during a short lesson. Shop talks or motion-picture lessons requiring a longer period of time should be given in a classroom.

(Concluded on page 66)



General Shop, East New York Vocational High School. Mr. Eric Kebbon, Architect. Room measures 22 by 56 feet.

# Carmel High School

J. W. Getsinger<sup>1</sup>

Carmel-by-the-Sea is unique. From the time that Monterey pines began growing on its seaward slopes, all the way down to the sand dunes, with gnarled cypress in the sand and among the rocks yielding to the frequent sweeps of wind from the blue Pacific, Carmel has been different. When Father Junipero Serra selected it as the site of his home mission, chose it as the place in which to live out his days and be buried, it was a charming spot. It has remained so these many years until history has yielded the perspective to propose his canonization.

Carmel has stimulated such diverse characters as George Sterling, Harry Leon Wilson, Lincoln Steffens, Mary Austin, Robinson Jeffers, Fred Bechdolt, Sam Blythe, and Jimmie Hopper. Painters, sculptors, and wood carvers have immortalized its beauty in a thousand ways. David Starr Jordan chose it as the place for the "Little Faculty Row" that Stanford professors might come here to relax.

During all the years that Herbert Heron has been producing Shakespearean plays in the Forest Theatre, a natural amphitheater in a pine forest, and the more recent times when the Bach Festival has been held in the stately Gothic setting of the Sunset School auditorium,

with its final number, the B Minor Mass, in the Mission San Carlos de Borromeo, Carmel has been devoted to cultural things.

So, when Carmel decided, four years ago, to have its own high school, and formed the Carmel Unified School District to effect that purpose, it might have been expected to plan a high school plant in keeping with its traditions. The pictures on this page will show that this has been realized.

Otto W. Bardarson had been principal of Sunset (elementary) School for some 12 years when the unified district was formed. Devoted to the service of youth, forward looking in his educational philosophy, this big, blond, former college wrestling champion, whose forefathers had helped to establish the first parliament in Iceland more than a thousand years ago, had been a leader in elementary education from the time he first came to

Carmel. He was the natural choice to lead in the formation of the new high school, and was named district superintendent, and first principal of the new unit.

Otto Bardarson lived only long enough to see his building plans completed, the new school well organized and in operation. Barely 44 years old, he was struck down in December, 1942, by a heart attack, in the office of the school he had planned. So greatly was he loved by the community that an Otto Bardarson Scholarship Fund, for the assistance of students of the Carmel schools in obtaining a higher education, was established by voluntary contributions of his friends.

Bardarson was ably backed by school-board members and citizens. Especially active were the late Mrs. Doris Watson who stuck to her guns through all the hard work, pressure from interest groups, encouragements and criticisms of elections, bond campaigns, selection of a site, and letting of contracts; and Miss Clara Kellogg who brought her background of teaching and her broad business and political experience into the good teamwork necessary to accomplish the project. Peter Mawdsley, accountant and chairman of the board at the time, dealt with the problem of tax rates, bond redemption, sale of bonds, and handling of finances.

And Hugh W. Comstock, Carmel designer and builder of distinctive modern homes was elected to the board partially to lend his influence and experience to the project. In his buildings Comstock has used a great deal of hand-hewn redwood, heavy redwood roof shakes, and an improved type of native adobe brick. He likes buildings that blend naturally into their surroundings, are cleanly functional, modern in their utility, and lend themselves to California outdoor living.



Access to the administration and classroom units is by means of well placed stairs and terraces and covered corridors. The foundations of the buildings and the retaining walls are adobe bricks. The steps and curbs are of sandstone, the roof of redwood shake. The open corridors are roofed with copper and the large windows have full length curtains.



Carmel High School, Carmel-by-the-Sea, California. — The terrace outside the library provides a magnificent of the picture. In the left foreground is the cafeteria

<sup>1</sup>District Superintendent of Schools, Carmel Unified School District, Carmel-by-the-Sea, Calif.



Ernest J. Kump, Architect, San Francisco, California.

view of the Carmel Valley and Carmel Bay, and beyond to the Pacific Ocean not quite visible at the extreme right and in the center the gymnasium and athletic fields.

(Photographs by George Seideneck, Carmel)

Comstock has developed the use of steel and concrete with the modern type of adobe brick, which utilizes the ancient ingredients of native adobe mud, straw, and water, baked in the sunshine, but adds a small percentage of emulsified asphalt to make them impervious to water. The modern type does not melt down, even when exposed to continuous rain.

For an architect the board looked far and wide, searching for a man who could interpret Carmel's ideas while making the plant modern in its utility, reasonable in cost, and highly functional educationally. The choice fell on Ernest J. Kump of Fresno, Calif., who later became associated with Charles H. Franklin and moved his main office to San Francisco. Kump had specialized in the design of public buildings. He proved to be ready to take suggestions, capable, imaginative, with a fine understanding of the conditions and problems involved.

Meantime a site had been selected. This was not an easy process; there was considerable pulling and hauling in various directions before the 22 acres facing California State Highway No. 1, at the intersection of Ocean Avenue, was finally decided upon and purchased for \$31,000. A rolling hilltop, this site had a glorious view of the Carmel Valley, Carmel Bay, Point Lobos, and the wide, open Pacific. With a reasonable amount of grading and much skillful planning, space was found for the buildings, athletic fields, roads, walks, and lawns, to make this one of the most picturesque and beautiful school plants anywhere.

The community voted a bond issue of \$165,000 for site and plant, fully expecting to secure a federal grant on a 40-60 basis. But the PWA grants were discontinued just at that time. A WPA grant was sought, but finally given up after much effort. The board

decided to go ahead, build as much as it could with the money in hand. The administration building, library, homemaking unit, and two classroom units were completed with the necessary heating plant, roads, and the rough grading for the athletic fields. The new high school was organized and started off with just over 200 students in attendance.

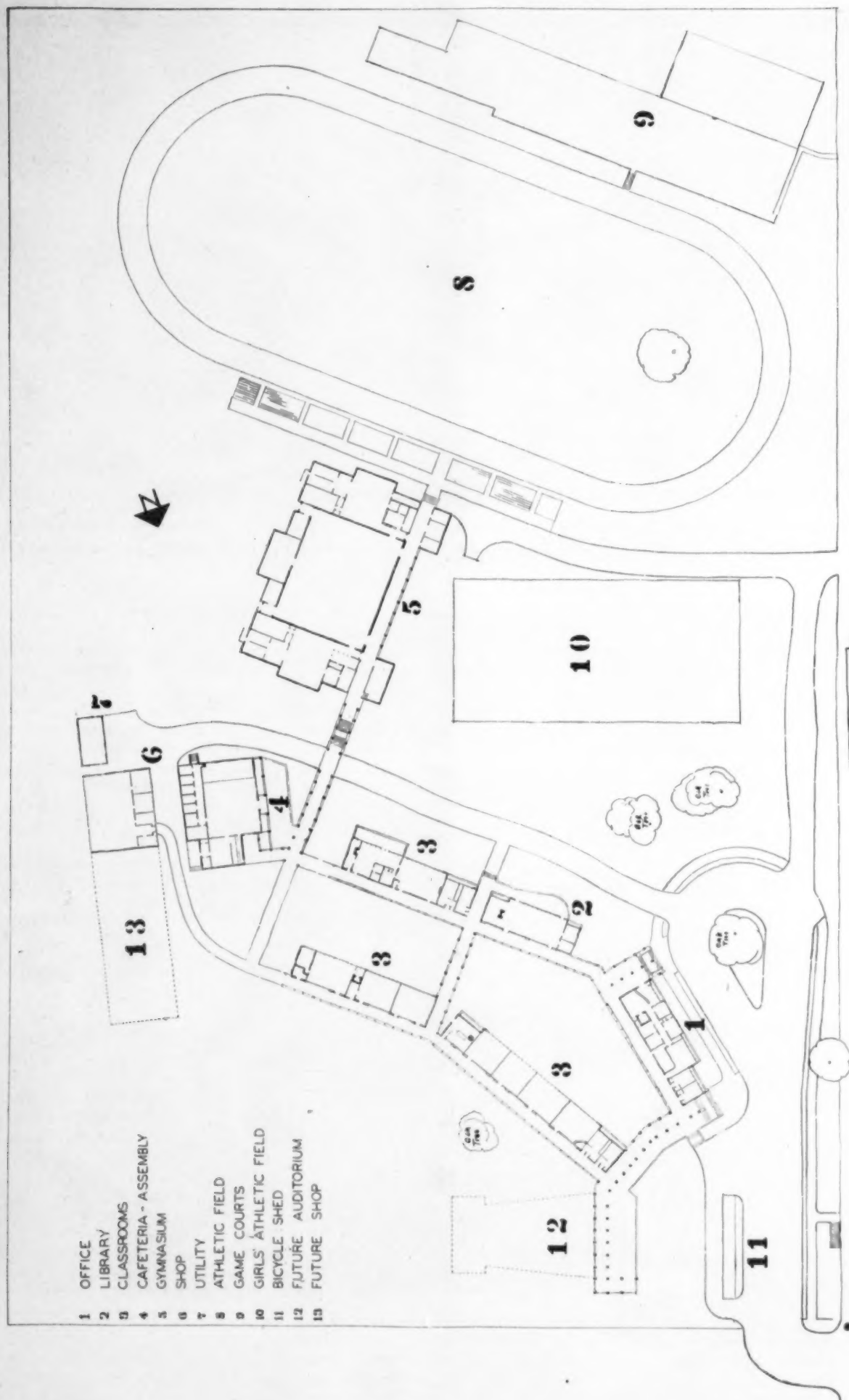
There was no gymnasium, no shop, no cafe-

teria, only a "dust bowl" for athletics, no music room, and a shortage of classrooms. But the board had done well with the money it had, the part of a school that had been completed promised so well that the community came to the rescue with more money.

Tentatively the board inquired of citizens their attitude toward a bond issue of \$75,000 for most needed units. At a public meeting

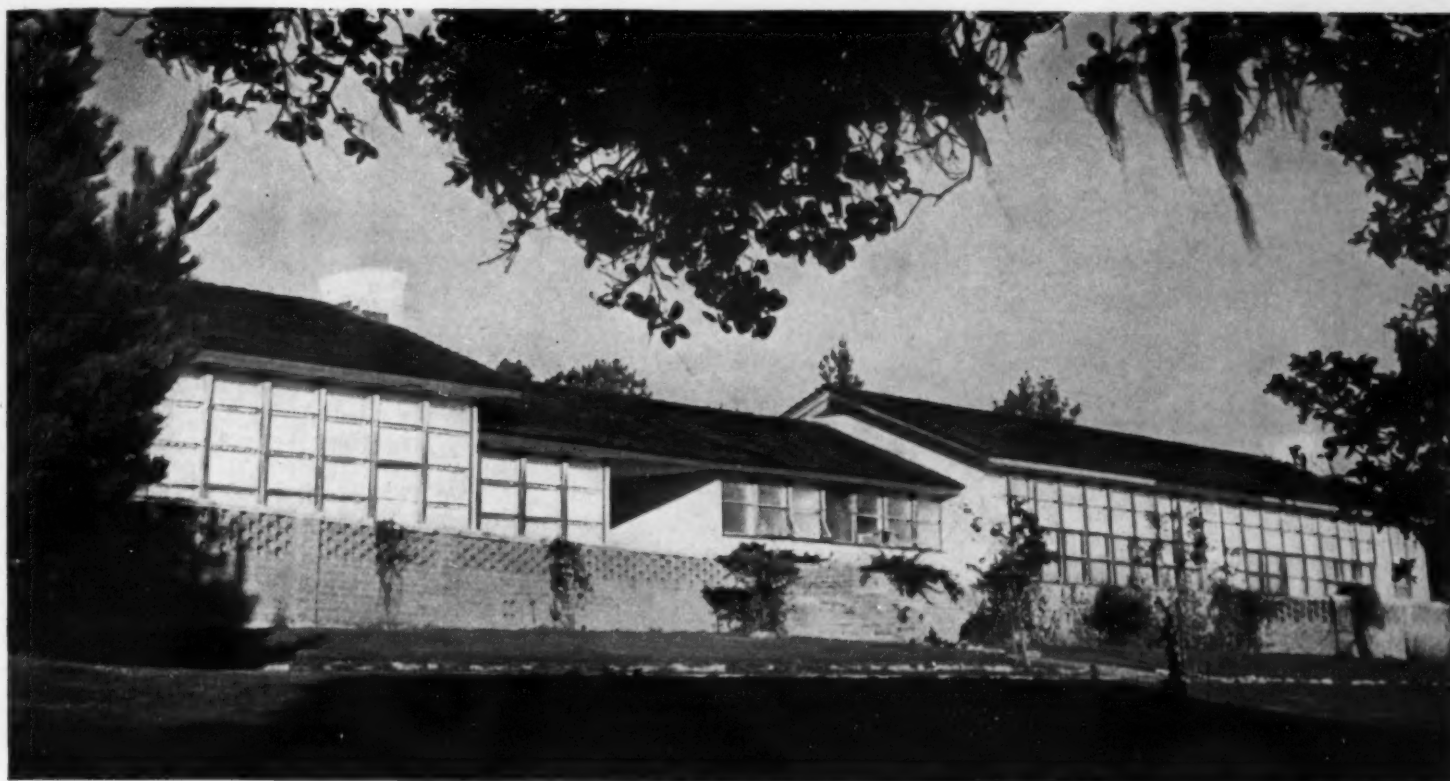


The library, which is the academic nerve center of the school, is finished with plastered walls, acoustic ceiling, and battleship linoleum floor, all harmonizing with the light brown furniture and wall shelving. Above the fireplace is a stone tablet in memory of Mrs. Doris Watson, one of the school trustees who was instrumental in the formation of the school.



Plot Plan, Carmel High School, Carmel-by-the-Sea, California.  
The area in general where the list of buildings appears has been reserved for future classroom buildings. An early extension of at least one classroom is planned for building number three.

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The library and homemaking units looking toward the terraces on the southwest side of the buildings, Carmel High School, Carmel, California. — Ernest J. Kump, Architect, San Francisco, California.

citizens expressed the view that this would not be enough, that the school plant should be completed, and the necessary funds provided. The board estimated that \$150,000 would build a gymnasium, a cafeteria (which would also serve as music room and assembly hall), a shop, and two classrooms.

But again events interfered and the prices of labor and material advanced so rapidly in 1941 that the classrooms had to be omitted from the final contract. They are now the first necessity on the postwar work pile.

The present plant, built under two contracts, one in 1939, the other in 1941, cost a total of \$284,000. Its architectural and planning problems were unique, because of the sloping hill on which it was built, Carmel's unusual background, and the fact that there were no old buildings to be dealt with.

Architect Kump says: "... The final solutions ... were in a great measure due to the excellent understanding of the school needs and community problems by the district superintendent and members of the school board ... and also the unusual knowledge of materials, site conditions, and planning experience, typical of Carmel, offered to the architects through Hugh Comstock, a member of the board."

This school building group was created to be flexible in accommodating schoolhousing problems, essential activities of the community, and the functions of a general cultural center. Easy circulation for varied uses, and normal expansion of the necessary facilities to meet a natural community growth were sought.

The buildings were placed on the hilly portion of the property, athletic and play fields on the more level southern portion. The master plan was developed to include the later addition of a large auditorium-theater facing the entrance to the school grounds. The administration unit is located near the entrance, accessible to the public on the one hand and to the students on the

other with a minimum of cross circulation. Parking for these units was planned on the site.

The gymnasium was placed between the classrooms and the athletic fields with easy access also to the community at large for sports events. The cafeteria was designed to serve as a music room, assembly hall, and small theater as well. It has ample kitchen



—George Seideneck, Photos.

Open corridors provide for easy sheltered travel between the individual classrooms and buildings.



The speech room gives a clue to the lighting and finish of the classrooms which generally have full length windows to the north, short high windows to the south, acoustical tile ceilings, tack boards for display, linoleum floors, light colored furniture, and modern lighting fixtures.

facilities on one side, an adequate stage on the other. The shop building provides for expansion to several times its present size.

Classroom expansion has been provided for north of the existing classrooms to accommodate up to 1200 pupils or more. The original buildings were planned for about 250 students. They include an administration unit, general classrooms, a homemaking and art suite, and a science and commercial section. There are also the necessary toilets, central steam heating plants, and storage space.

The buildings are constructed with concrete foundations and a wood frame laid out on the unit basis, with steel framing for the gymnasium, cafeteria, and shop. All units were planned on the basis of a 4-ft. module for uniformity in scale and economy in the use of structural materials.

The exterior finish is based upon the selection of local materials, as far as practicable, produced by hand on the site and characteristic of the area. In this instance these materials involve no compromise either with functional design or practical economy. The roofing of all structures consists of hand-split redwood shakes acquired from the redwood forests along the coast south of Carmel. The exterior masonry consists of handmade adobe bricks, stabilized with bitumuls. The roofs of the exterior corridors are covered with 6-oz. copper roofing.

All exterior posts and lintels are constructed of hand-hewn redwood, also secured locally. The general exterior covering of the building has cement stucco over metal lath with an uneven texture. The windows are of steel-sash project-out type, with hand-hewn trim and sills. The use of these unusual materials produces a charming and interesting effect.

All standard rooms were planned with a 28-in. wide clear span. This width has proved highly satisfactory in contrast with the usual classroom width of from 21 to 24 feet.

The interiors are of plywood wainscoting, stained natural, with walls of white Monterey sand finish, and acoustical tile ceilings. The natural lighting is bilateral, comprising full-length windows on one side with 4-ft. high continuous transom windows on the corridor side and above the exterior corridors. The result is a very even illumination across the entire room. The full-length window walls are equipped with drapes with sliding track for light control, the density of the drapes having been determined by experiment to allow admission of light with a minimum of glare. Some rooms are equipped with lined drapes so they may be darkened for moving pictures.

The structural frame of the building is so constructed that all interior partitions are nonbearing and movable for possible future changes.

The furniture is bleached pecan in finish, all interior floors except the gymnasium and cafeteria are finished in battleship linoleum, the exterior corridor floors in asphalt.

The Carmel High School was planned to be a six-year junior-senior high school, but community growth and the delays in completing the new plant caused only five grades, the eighth through twelfth, to be established there in 1940. This division has proved so satisfactory to the administration that the plan has been continued. The elementary school likes having the seventh graders, finds them just the right age to finish up their pre-adolescent training. The high school finds the eighth graders mature enough to be part of

its life and activities, the entire arrangement seems eminently pleasing.

This year 280 students are registered in the 5 grades, with 13 full-time teachers and 4 specialists who divide their time between the high school and the elementary school. The unified district permits the use of these specialists where they can best serve, and makes a well-articulated educational program possible.

#### STEPS IN SCHOOL-BUILDING PLANNING

In a statement presented to the school committee of Barrington, R. I., Supt. Ralph D. McLeary has outlined the major steps to be taken in the planning and construction of a school building. Mr. McLeary holds that before any further steps are taken, the educational program must be formulated with the advice of the members of the high school staff. A second step is the employment of suitable advisory service, and a third step is the employment of an architect. Mr. McLeary writes as follows:

"The first step is to lay out in definite form, upon which agreement may be reached, the educational program for which the new building is to be designed.

"The second step is to list and describe in usable form the areas, spaces, facilities, and equipment which will be necessary to carry out this program. These must be described in sufficient detail to make it feasible to draw up preliminary sketches. It is essential that the interrelations of the walls, areas, spaces, and items of equipment be carefully studied so that their relative situations in the plans can be properly determined.

"The next step, which may even be coincidental with the previous one, is the employment of an architect and of an educational advisory service specializing in the design and equipment of school buildings. It is probable that an architect can be retained with provision made that if he be awarded the contract for the architectural planning of the building his retaining fee will be considered to be part of his usual percentage fee.

"One of the next steps will be the passing of a resolution at the town meeting authorizing the construction of the building, the appropriation of funds, and the raising of these funds by suitable means. Following this will come the awarding of the contract to the architect and the final development of the plans by him. These in turn must be formally accepted by the school committee.

"A subsequent major step will be the issuance of bids for the contract in accordance with the plans and specifications drawn up by the architect. Upon the receipt of the bids the contract must be awarded in accordance with the bid conditions.

"This is not by any means a complete list of all the matters which must be considered for this project. The superintendent presents it here only as a preview of what lies ahead. The order of the steps cannot be definitely determined at this time. There will be many other problems including the possible necessity of having a special act in the general assembly; the consideration of the use of government funds, the establishment of the school committee as the building committee, the approval of the plans by the state department, and by the various authorities in charge of insurance regulations, fire regulations, and other things of equal importance."

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# Postwar School Planning

Daniel Paul Higgins, A.I.A.<sup>1</sup>

There is a danger that the so-called "Postwar Planning" for schools can be overemphasized, and even to the degree that it could become detrimental to the best interests of our children.

"Prewar" or "postwar" school building is not in itself the prime objective of our various school systems. I emphasize this because the welter of words in magazines and newspapers seems to foreshadow a new day awaiting the end of the war when marvelous new devices will work miracles for the field of education. It just isn't so!

In attending a meeting of the board of directors of a large savings bank I think of its functions and end results in terms of our educational system. Again, attending meetings of the commissioners of the board of education I think of our operation of the bank. Why? Simply this—we as parents deposit our children in the school system. The school system returns our children whom we deposit for one or many more years. We as depositors want and demand the return of our original deposit, but we want interest and we want it in liberal quantities. The savings bank must return the original deposit and must operate, to be successful, so that the end result is security and interest to the depositor. The difference is that in a bank the mechanics involved show a factual return, plus or minus as the case may be, but we as trustees must ever be mindful of security and profit.

Would that as a commissioner of an educational system, one could measure to some appreciable degree whether the deposits, the most valuable in the world—human beings—are being returned, plus or minus, and to what degree.

Just one more word of caution in respect to postwar construction of schools. The actual, physical school building is a relative matter. I know, and know from experience, that a school teacher, whose teaching is influenced by what is in her heart, can teach and produce real results if the classroom were a tent. It is true likewise, that a learned teacher, using the most modern devices of the best planned school building, can be a colossal failure because the motivation is mental and not of the heart.

The little old red brick schoolhouse with a teacher *living a vocation* did a pretty good job. I am all for new schools. I am all for the adaptation of every worth-while modern technique and new but proved devices. Yet, our

children are not material substances but are human—love, hate, hope, despair; flesh and blood, wills of their own, lives to lead, salvation to achieve.

I mention all this because as a private architect and as a member of a school board which in the past five years has actually built 82 new school buildings and at this moment has on the drafting boards plans for 70 new school buildings one might expect an emphasis on the new school as an educational asset. It does not follow. I visit new schools and old schools. Yes, I do look for any cracks or signs of wear, etc., but I look at the erection of the children to the teaching staff of that particular school. The principal of a new school may lead you from here to there, displaying this and that new feature, but if the children cast furtive glances, show evidences of lack of mutual good faith, what exactly is that school accomplishing? All this cannot be written into the specifications for the construction of a new schoolhouse.

Old schools grow older, populations shift, new neighborhoods come into being, trades and professions require vocational schools, so we must ever build new schoolhouses. New schools are results of cause and effect within a community. All schools can, and should continue to make worth-while contributions.

I often wonder if our best school principals as they merit promotion were assigned to older schools, would people leave a particular neighborhood quite so fast? Certainly our less able school administrators should do better in a new school. I know this principle is not followed, but in retrospect would we need so many new school buildings due to shifting population, if parents felt that they will sacrifice the well-being of their children by leaving the old school behind? I don't know. Maybe it is something to think about.

New York City, made up as it is of suburban and densely populated areas, is a fairly good cross section of problems elsewhere. The planning and design of 40 new schools by our departmental architectural staff and assignment of more than 30 projects to private architects is a good laboratory test of what is to come.

Generally speaking, there is no outstanding problem due to building materials or labor. These items have been and will be governed more by climatic conditions, building codes, and the question of supply and demand.

The whole question of new materials and new scientific advances seems to disturb many people concerned with new construction. Regardless of the type of school, regardless of the functions, regardless of the location, the question of material does not have to be considered in the sense of being of prime importance. Members of school boards and school executives can forget the whole question of the details of construction.

No one can foresee conditions 25 years hence, but we can and should see our responsibility to provide safe places of assembly. A temporary building is one which will probably disintegrate and fall apart in a very few years, say three, four, or five years. Some people call a wooden building "temporary," because it is not made of steel and brick. Our forefathers built of wood and the structures have stood 200 years. What we mean when we say "temporary buildings" as related to shifting populations, etc., is the difference in nonfireproof construction and fireproof construction. Building codes in most places definitely answer this question. Personally, as an architect and as a public school official, I do not want anything for our children but real fireproof construction. If parents, who pay the taxes, were asked to answer the question of a "temporary" nonfireproof building, to stand say 40 years to save some money, or a fireproof building to protect their children at some additional cost, I am confident that they would not consider any lowering of safety factors.

If we agree on fireproof buildings, the school official can safely leave the question of construction and materials as such to their experts. The building industry has been advancing for many hundred years, and what is new is evolutionary, not revolutionary.

As both an architect and a city school official, and I use this terminology simply as a premise, so others may judge for themselves who do not have this dual capacity, I think we should consider school architecture as a result and not primarily a separate creation.

Architecture is a reflection of the times. It does not, in itself, establish the various economic, social, religious, and political conditions in which we live. Good modern architecture is worth while. Traditional architecture is and always has been meritorious. The sound practice of architecture presumes that the design of a structure fit the problems, be it traditional or modern. Traditional design can be very simple, in good taste, and appropriate to the site and character of the school. The sad mistake is where either traditional or modern design is used erroneously. A small community, made up of nice homes, substantial and comfortable, suffers a distinct loss if a rambling modernistic school resembling a factory is dropped in its midst. Likewise to place a traditional building in the midst of markets, definitely wholesale and retail establishments, such a school to teach marketing, baking, meat handling, etc., could be an outrageous monstrosity.

Some educators are trying to fathom the future and gear their thinking and planning many years ahead—even 25 to 50 years ahead. The life of a community is not static nor are the factors which arise over a span of years predictable. It is axiomatic that, while

<sup>1</sup>The author, Daniel Paul Higgins, architect, partner in the firm of Eggers and Higgins who designed many nationally famous buildings such as the Jefferson Memorial, the National Gallery of Art, Silliman College at Yale, and other prominent buildings, has also designed schoolhouses, commercial buildings, war-plant structures, and other types of buildings.

Mr. Higgins has the unique experience of doing important private work and simultaneously directing, as chairman of the Building and Sites Committee of the board of education of New York City, the largest school construction program of any city in the world.

we have a growing population, we shall have an increase in suburban areas—new developments requiring all public facilities. We also shall have the former suburban area which matures and now requires high schools, branches of the main department stores, and other facilities peculiar to a settled community. We also have, and shall continue to have the return of former suburban dwellers to the city.

As values of city real estate lower in some sections it becomes possible to acquire real

estate at a price which makes possible the development of new modern structures. Cities must help this trend, otherwise the maintenance of all existing public facilities will create tax chaos. Old schools do become very important when sections of the city are radically changed. The general acceptance of the premise that so-called slums must be eradicated produces another problem in the utilization of present school structures and the construction of new ones.

The difficulty inherent in school planning,

and it may be such that it must be accepted as a constant problem, is the fact that population moves ahead of schools. Schools then are everlastingly in the process of catching up. It is similar to the problem of roads trying to catch up with the progress of automobiles.

It is well that so much thought and effort is being directed to the problem of all kinds of schools—public, private, elementary, and high schools and colleges. Democracy can flourish best when safeguarded by enlightened people.

## The Relationship Between Sizes of School Sites and Land Costs

Samuel H. Barkan<sup>1</sup>

In the city of New York where residential saturation has reached a high degree, the selection of school sites constitutes a very difficult problem. The board of education of New York City is exceedingly anxious to have adequate play space for all of its schools. Land costs are in many instances, however, very high, running to \$20 and more per square foot. In outlying areas where residential de-

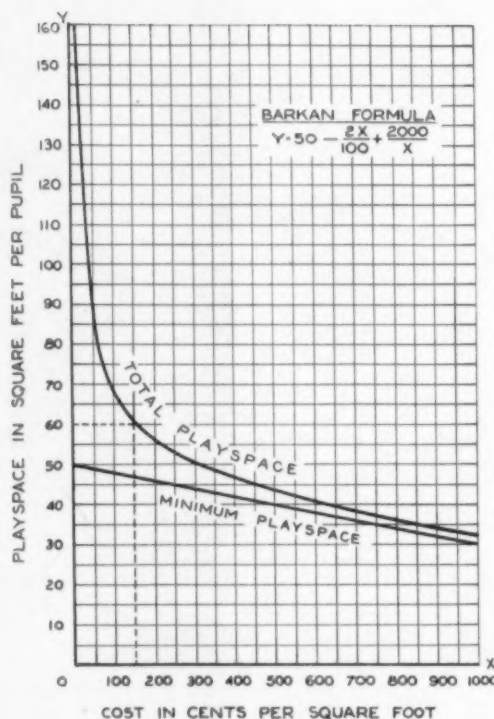
TABLE A

X	Y	XY
Cost per sq. ft. in cents	Minimum sq. ft. per pupil	Cost per pupil
0	50.0	\$ 0.00
10	49.8	4.98
20	49.6	9.92
30	49.4	14.88
40	49.2	19.68
50	49.0	24.50
60	48.8	29.28
70	48.6	34.02
80	48.4	38.72
90	48.2	43.38
100	48.0	48.00
125	47.5	59.38
150	47.0	70.50
175	46.5	81.38
200	46.0	92.00
225	45.5	102.38
250	45.0	112.50
275	44.5	122.38
300	44.0	132.00
350	43.0	150.50
400	42.0	168.00
450	41.0	184.50
500	40.0	200.00
550	39.0	214.50
600	38.0	228.00
650	37.0	240.50
700	36.0	252.00
750	35.0	262.50
800	34.0	272.00
850	33.0	280.50
900	32.0	288.00
950	31.0	294.50
1000	30.0	300.00

The relationship between  $x$  and  $y$  may be expressed by the equation:

$$Y = 50 - \frac{2x}{100}$$

and is represented graphically by a straight line (see attached graph).



Graph illustrating application of Mr. Barkan's formula.

velopments are rapidly progressing, costs may be as low as 50 cents to \$1 per square foot.

The board of education has set up a minimum acceptable play space at 30 square feet per pupil. Dr. N. L. Engelhardt, associate superintendent of schools in charge of the Division of Housing and Business Administration, has, however, pointed out that where land costs are low, this minimum of 30 square feet is lower than would be acceptable in many other communities in the country. The board of education has, therefore, endeavored to discover how to relate the size of school sites to land costs. The result has been this formula, which is reported here. The formula enables the school authorities to determine on the size of site required for a given

New York City school with direct reference to the given land cost per square foot.

Certain general assumptions are basic to the derivation of this formula. They are as follows:

1. All children, regardless of the cost of land in the neighborhood in which they live, should have an adequate minimum amount of play space.

2. As land costs increase, it may be desirable, and even necessary, to decrease the sizes of sites. The number of square feet of play space will decrease accordingly.

Conversely, when land costs are very low, the city should take advantage of these low costs to provide additional play space beyond the acceptable minimum.

There are certain particular assumptions which have been more or less arbitrarily arrived at but which have been thought reasonably desirable in the development of the formula. They are as follows:

1. When land costs 15 cents or less a square foot, the costs are sufficiently low to provide approximately 200 square feet of play space per pupil.

2. The acceptable minimum play space is placed at 30 square feet per pupil.

3. In general, sites should not be selected on lands costing more than \$10 a square foot.

### The Component Parts of a Site

Every site should consist of two parts:

a) The part occupied by the building, including courts and landscaping

b) A certain minimum amount of play space, inversely proportional to land cost. This should vary from 50 square feet per pupil to 30 square feet per pupil as land costs increase from 0 to \$10 a square foot.

Note: The upper and lower limits have been chosen empirically so as to result in sites of reasonable size and cost. Any changes in these limits will not affect the general theory, and can easily be incorporated by means of simple adjustments of the constants in the formulas developed on the next page.

<sup>1</sup>First assistant assigned to Division of Housing, New York Board of Education.

### The Minimum Play Space

Let it be assumed as in Table A that when land costs nothing or nearly nothing, the minimum acceptable amount of play space should be 50 square feet per pupil and that for each increase of 50 cents a square foot the play space is decreased by 1 square foot. Note that at \$10 a square foot, the minimum play space is 30 square feet.

Please refer to Table A.

### The Additional Play Space

Let it be assumed that \$20 per pupil should be spent for additional play space beyond the acceptable minimum. Note that the product of  $x$  and  $y$  in Table B is practically always \$20.

TABLE B		
X Cost per sq. ft. in cents	Y Additional sq. ft. of play space per pupil	Cost per pupil
0	150.0	\$ 0.00
10	150.2	15.02
20	100.0	20.00
30	66.7	20.00
40	50.0	20.00
50	40.0	20.00
60	33.3	20.00
70	28.6	20.00
80	25.0	20.00
90	22.2	20.00
100	20.0	20.00
125	16.0	20.00
150	13.3	20.00
175	11.3	20.00
200	10.0	20.00
225	8.9	20.00
250	8.0	20.00
275	7.2	20.00
300	6.7	20.00
350	5.7	20.00
400	5.0	20.00
450	4.4	20.00
500	4.0	20.00
550	3.6	20.00
600	3.3	20.00
650	3.1	20.00
700	2.9	20.00
750	2.7	20.00
800	2.5	20.00
850	2.3	20.00
900	2.2	20.00
950	2.1	20.00
1000	2.0	20.00

The relation between  $x$  and  $y$  may be expressed by the equation:

$$y = \frac{2000}{x}$$

### The Total Amount of Play Space

Adding the amounts of play space in Tables A and B, we have for the total play space the areas in Table C.

TABLE C		
X Cost per sq. ft. in cents	Y Total sq. ft. of play space per pupil	Cost per pupil
0	200.0	\$ 0.00
10	200.0	20.00
20	149.6	20.92
30	116.1	34.88
40	99.2	39.68
50	89.0	44.50
60	82.1	49.28
70	77.2	54.02
80	73.4	58.72
90	70.4	63.38
100	68.0	68.50
125	63.5	73.38
150	60.3	90.50
175	58.0	101.38
200	56.0	112.00
225	54.4	122.38
250	53.0	132.50
275	51.7	142.38
300	50.7	152.00
350	48.7	170.50
400	47.0	188.00
450	45.4	204.50
500	44.0	220.00
550	42.6	234.50
600	41.3	248.00
650	40.1	260.50
700	38.9	272.00
750	37.9	282.50
800	36.5	292.00
850	35.3	300.50
900	34.2	308.00
950	33.1	314.50
1000	32.0	320.00

The relation between  $x$  and  $y$  may be expressed by combining the equations of Tables A and B, as follows:

$$y = 50 - 2x + \frac{2000}{x}$$

This equation is expressed graphically by the curved line on the attached graph.

### Illustrations of the Application of the Formula

Table D shows the sizes of sites that should be obtained for a school for 1000 pupils in areas of various land costs and the amounts that should be expended for those sites.

### Further Illustrations

Table E shows the total areas and costs of sites suggested by the formula for schools of various types and sizes. At the present time, New York City is planning 67 new school-houses, including elementary, vocational, and junior high school buildings. Site selection

represents, in many instances, great difficulty but the board of education and the New York City board of estimate had in August, 1943, approved a large majority of the required sites ranging in cost up to approximately \$1,250,000 for a single site. New York City's board of education in this planning is replacing old, outworn buildings, is building new structures for the newly developing residential sections of the city and is planning high schools which will meet the post war needs of youth. New York City intends at the close of this war to be ready to offset unemployment difficulties, and at the same time, to rebuild where needed so that this city will retain its supremacy among the cities of the world.

### Observations

1. An analysis of the formula reveals that when  $x$  is less than 13.3 cents per square foot,  $y$  is greater than 200 square feet; and that when  $x$  is greater than \$10.90,  $y$  is less than 30 square feet.

The formula is applicable, therefore, only when land costs more than 13.3 cents a square foot and less than \$10.90 a square foot. It is recommended that when land costs are outside of these limits, play space should be fixed at 200 square feet as an absolute maximum and 30 square feet as an absolute minimum; that is, under no conditions should play space ever be more than 200 or less than 30 square feet per pupil.

2. Strict adherence to the amounts or sizes recommended by the formula is obviously impossible when sites are limited by street boundaries or by encumbrances which it would be impractical to remove, or by budgetary considerations.

In instances of this kind, the projects should be considered as special cases. It may be necessary in such cases to plan buildings more than three stories in height or to accept less than the desired amount of play space.

Conversely, when the formula indicates a site that is deemed too large, it may be desirable to consider the planning of a two-story building, spread over a large area, rather than a three-story building, or to select a site smaller than that suggested by the formula.

TABLE D						
Cost per sq. ft.	Sq. ft. play space per pupil	Sq. ft. play space for 1000 pupils	Sq. ft. required for building	Total area of site	Total cost of site	
\$ .25	129.5	129,500	30,000	159,500	\$ 39,875	
.50	89.0	89,000	30,000	119,000	59,500	
1.00	68.0	68,000	30,000	98,000	98,000	
2.00	56.0	56,000	30,000	86,000	172,000	
5.00	44.0	44,000	30,000	74,000	370,000	
8.00	36.5	36,500	30,000	66,500	532,000	
10.00	32.0	32,000	30,000	62,000	620,000	

TABLE E												
Cost per sq. ft.	3-story elementary school for 500		3-story elementary school for 1000		3-story elementary school for 1500		3-story elementary school for 2000		3-story vocational school for 2000		8-story vocational school for 2000	
	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
\$ 25	79,750	\$ 19,938	159,500	\$ 39,875	239,250	\$ 59,814	319,000	\$ 79,750	359,000	\$ 89,750	.....	\$.....
50	59,500	29,750	119,000	59,500	178,500	89,250	238,000	119,000	278,000	139,000	.....	\$.....
100	49,000	49,000	98,000	98,000	147,000	147,000	196,000	196,000	236,000	236,000	.....	\$.....
200	43,000	86,000	86,000	172,000	129,000	258,000	172,000	344,000	212,000	424,000	.....	\$.....
500	37,000	185,000	74,000	370,000	111,000	555,000	148,000	740,000	188,000	940,000	128,000	640,000
800	33,500	268,000	66,500	532,000	100,500	804,000	133,000	1,064,000	173,000	1,384,000	113,000	924,000
1000	31,000	310,000	62,000	620,000	93,000	930,000	124,000	1,240,000	164,000	1,640,000	104,000	1,040,000



General Exterior, J. W. Sexton High School, Lansing, Michigan. — Warren S. Holmes Co., Architects, Lansing, Michigan.

## The New J. W. Sexton High School Lansing, Michigan Warren S. Holmes<sup>1</sup>

How does one adequately describe in fifteen hundred words a building which required much of the time of a large corps of people for an entire year for the development of the preliminary plans, and another year to make the seventy sheets of blueprints necessary for contractors to use for bidding and construction? The plain fact is, one does not. An adequate description of any department of this building, such as the shops, home economics, music, science, or recreational facilities, requires at least as much space as can be allotted to this article.

In urging the construction of this building at a time when war clouds hung heavy over much of the world, the superintendent of schools made clear to the board of education that the necessity was one of providing a modern school program for old Central High School which it was to replace. In particular, better facilities were urgent for that group of pupils not interested in college entrance. This group comprised 75 per cent of the student body.

<sup>1</sup>Warren S. Holmes Co., architects.



The foyer is a social gathering place for pupils and teachers. On the ceiling beams throughout the building lettered mottoes are important elements in the decoration.

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Central High School, parts of which were seventy years old, had definitely been designed for the study-recitation method. It was built when high school curriculums were formulated almost entirely on studies from textbooks. The changed times now demanded the supplementing of this bookish program with work-experience procedures. The new J. W. Sexton High School was to provide for this.

The new high school buildings in Michigan and adjacent states were inspected for ideas that could be used. The ideas picked up in this manner were seldom directly applicable to our problem. It was evident that high school buildings were still very conventional in plan and design and that, therefore, if this problem were to be satisfactorily solved, many new trails would have to be blazed.

The personnel to do this was at hand. Serving the board of education as superintendent of schools was Dr. J. W. Sexton, who had held this position for the past 25 years and previous to that time had been principal of the old Lansing High School for 5 years. During this time he had participated in the construction of the Lansing Eastern High School at a cost of \$1,500,000, three large junior high schools, as well as many elementary school buildings. This experience had given Dr. Sexton the opportunity to become intimately acquainted with the physical features of a school building that would make it possible to carry out a modern educational program.

The board of education's business manager was Mr. Harry L. Chamberlin, who is a civil engineer. He had been in charge of new construction and building maintenance in Lansing

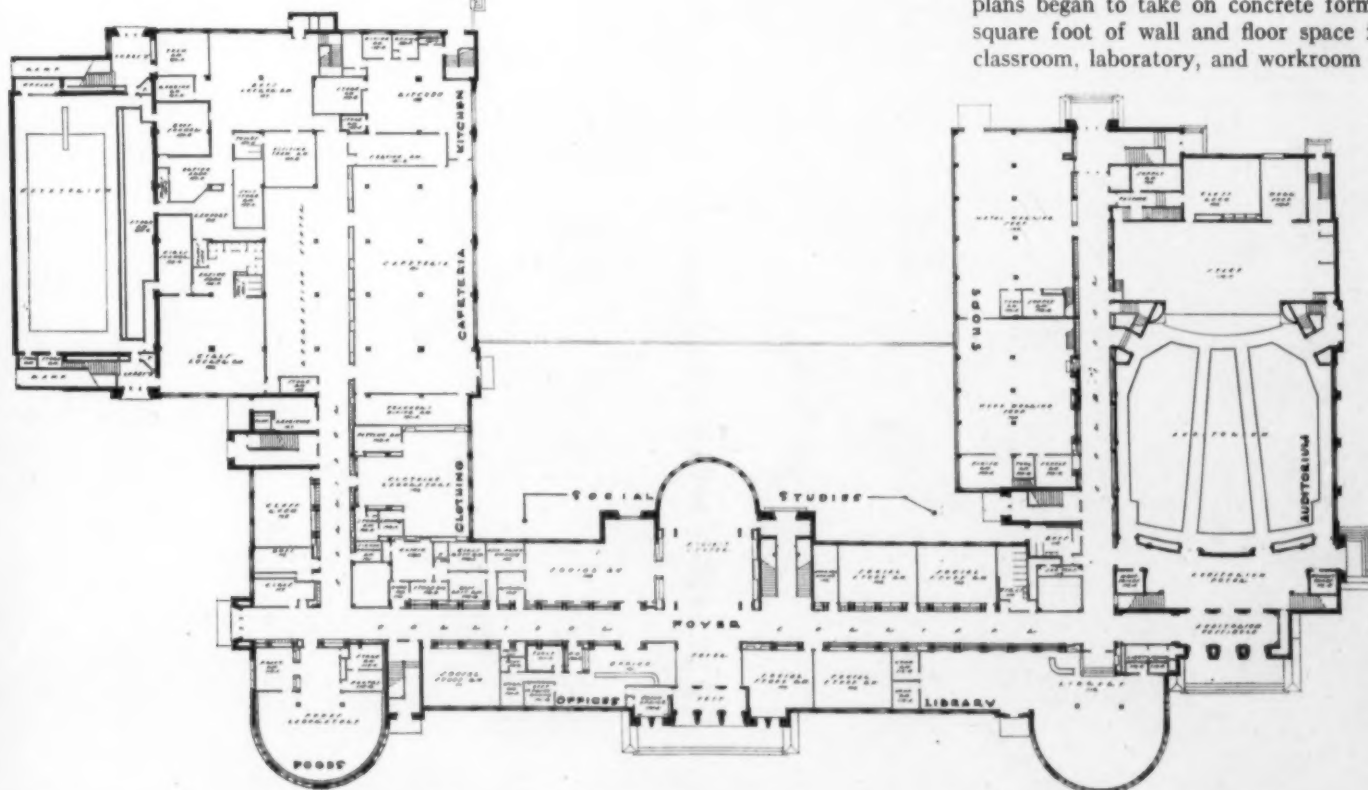


The dramatics room is attractively finished with knotty Michigan soft pine wainscoting and proscenium arch. The floor is linoleum. The radiators at left are built in and the ventilating inlets are near the ceiling.

for nearly two decades and was therefore eminently qualified to advise on all mechanical details.

Mr. A. D. Taylor, Cleveland, Ohio, was employed as landscape architect, and last but not least there were the experienced faculty

members of old Central, many of whom had been formulating dreams for a long time about how to improve their teaching and the work of their students, when proper facilities could be made available. Now these dreams could be realized if they could but be crystallized. It was not easy; it necessitated innumerable conferences and almost daily revisions of plans for many months, but presently the plans began to take on concrete form. Every square foot of wall and floor space in every classroom, laboratory, and workroom was uti-



First Floor Plan, J. W. Sexton High School, Lansing, Michigan. — Warren S. Holmes Co., Architects, Lansing, Michigan.



The band rehearsal room has been carefully treated with acoustical materials and tested to reduce noise but to retain the necessary vitality of the music. An interesting feature is the compartment case behind the director designed to hold students' books and current music.

lized to meet definite needs connected with this new school program.

The final result is a high school building more or less conventional in exterior appearance and general layout of plan, but very different from other buildings in the detailed provisions for the work to be carried on.

The building is designed for a normal

capacity of two thousand pupils, grades 10 to 12, inclusive, with extensive provisions for community use. The auditorium seats eighteen hundred. The two gymnasiums are divided by electrically operated folding doors; they seat three thousand persons when joined for a tournament game. The natatorium is planned with six lanes, 75 feet long. The cafeteria

seats four hundred for meals and two hundred when used as a study room.

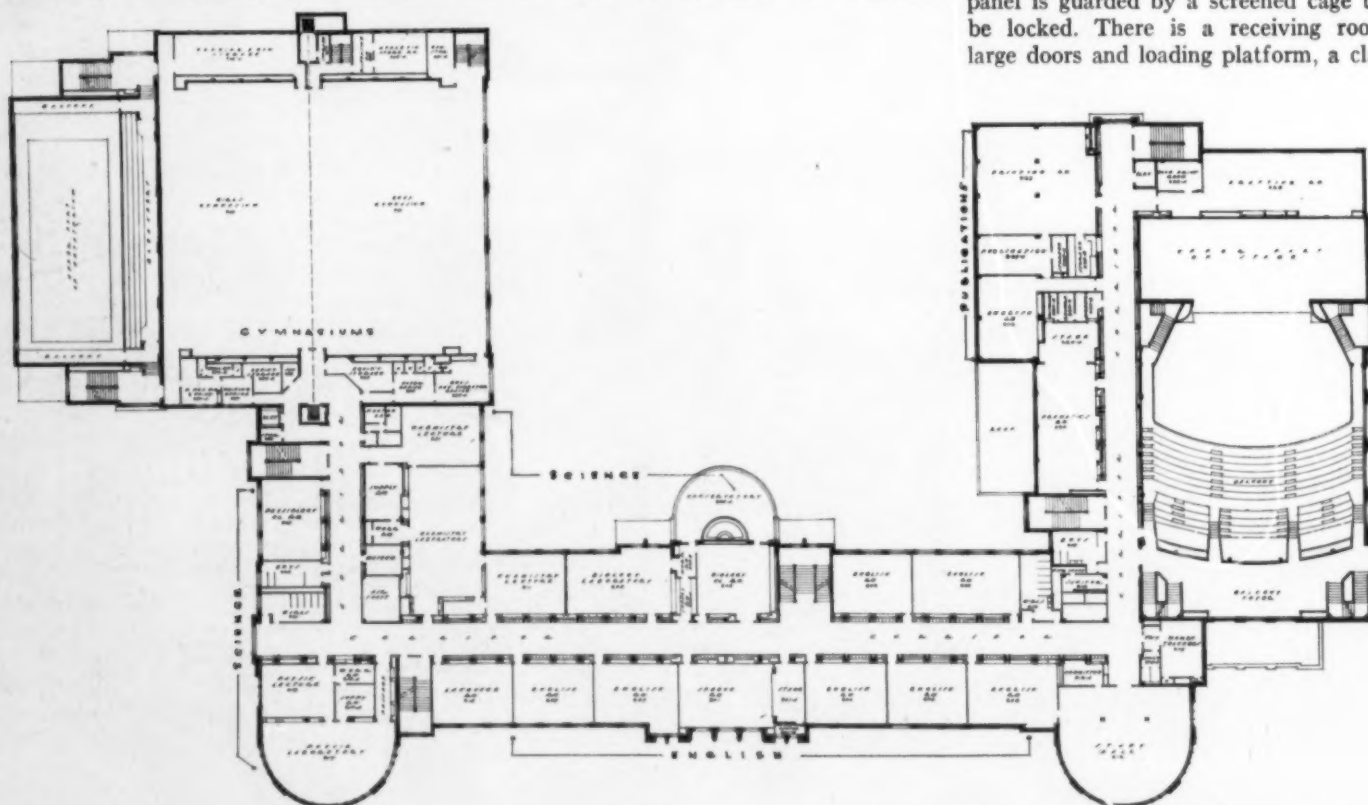
The home-room plan was adopted with auxiliary seating space in study rooms for 25 per cent of the student body, including seating in the library and cafeteria. The serving space and kitchen is shut off from the cafeteria by partitions and soundproof doors to facilitate the use of the cafeteria and teachers' dining room for other school purposes as above described.

A plan was adopted with the offices and classrooms in the center section, the gymnasium facilities in the south wing, and the auditorium, shops and music department located in the north wing. This plan gives the best orientation for the classrooms and facilitates segregating those parts of the building in most frequent demand for community use.

The heating plant was placed on the south end instead of the usual court location to avoid its intercepting the attractive views of the 31-acre school site from the foyer and classrooms.

The gymnasiums have toilets and coatroom facilities available, without use of the locker rooms, when in use for parties and dances. The kitchen and cafeteria are conveniently reached from the gymnasiums so food does not have to be served in these gymnasiums. Eyebolts were provided in the walls of the gymnasiums for attaching wires for decorations, thereby eliminating the excuse for pupils climbing in the roof trusses.

The auditorium facilities were made to conform to the requirements of the Cities Civic Players. In addition to the usual stage facilities there is a recess into which the piano can be moved and locked up. The stage lighting panel is guarded by a screened cage that can be locked. There is a receiving room with large doors and loading platform, a classroom



Second Floor Plan, J. W. Sexton High School, Lansing, Michigan. — Warren S. Holmes Co., Architects, Lansing, Michigan.



The library is the most attractive and widely sought room in the J. W. Sexton High School. The woodwork is white oak and walnut; the floors are rubber tile in browns and buff.

adjacent to the stage and a shop. The space under the stage is developed for boys' and girls' dressing rooms and is fitted with toilets and make-up room between. There is also a larger room provided with closets, access to toilet, and outside entrance that can be used for the orchestra to retire to or for scout troops.

The classrooms are seated with tables and

chairs and equipped for student club activities. This specifically takes the form of one or more cabinets in each classroom where unfinished project materials can be stored under lock and key. Each room used for class purposes is provided with a minimum of 20 linear feet of cases and cabinets especially adapted for the work for which the classroom is designed.

The designation "functional high school" can have a great variety of interpretations. It is to be presumed that all new high school buildings are intended to be made functional by those responsible for their design. Its specific meaning in connection with the J. W. Sexton High School is illustrated in the music department.

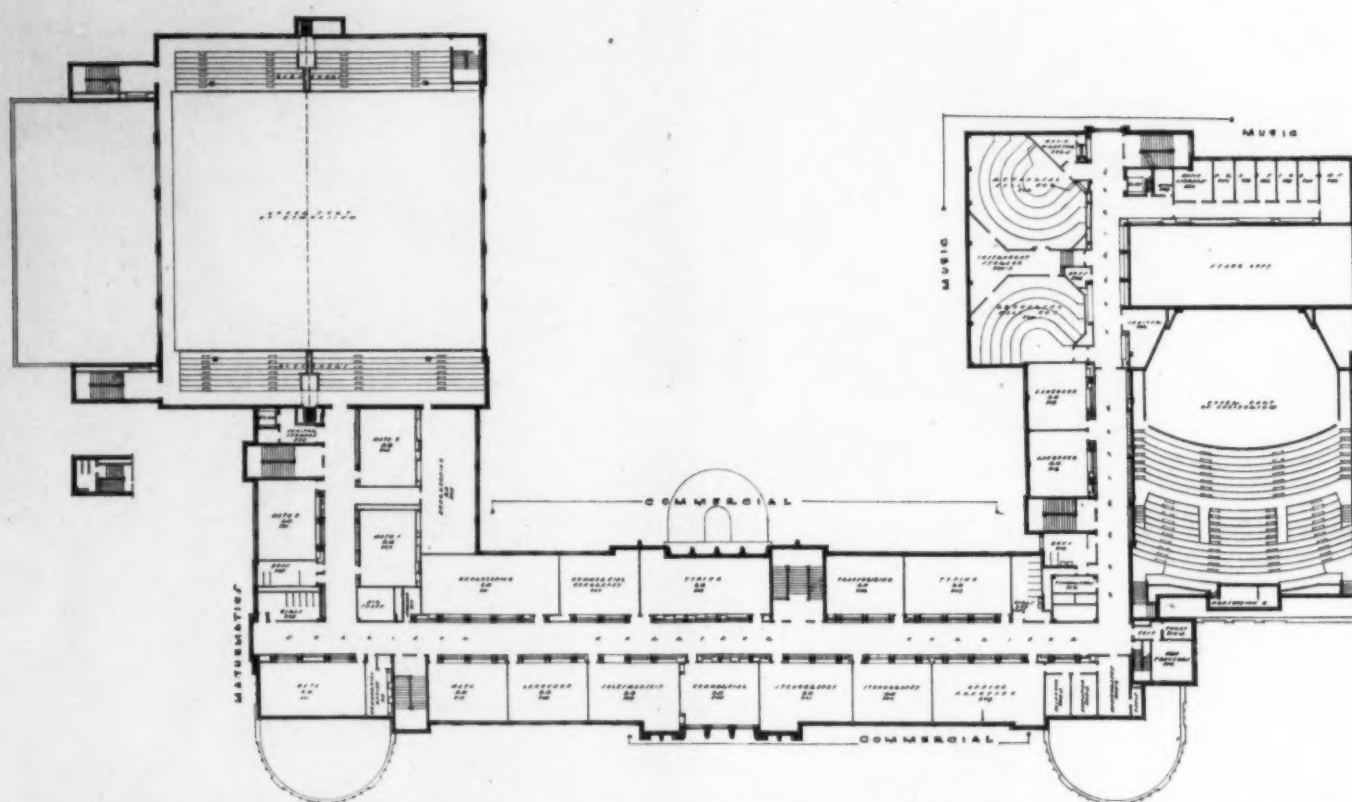
This department is located on the third



The printshop has continuous windows and is provided with a lecture arrangement containing tablet arm chairs and tables.



The biology laboratory has interesting exhibit spaces for pictures and mounted animals. The room may be fully darkened for visual instruction.



Third Floor Plan, J. W. Sexton High School, Lansing, Michigan. — Warren S. Holmes Co., Architects, Lansing, Michigan.

floor in the auditorium wing. It has two rehearsal rooms, one for band and one for choral work. These differ principally in the amount of acoustical treatment, for acoustical treatment desirable for band work is decidedly too much for vocal work; it makes voices flat and unnatural. These rehearsal rooms have the raised seat benches arranged in circular form, with a raised dais at the center for the director. The floor construction is sup-

ported on spring clips with finished linoleum floors in attractive patterns with the nosing secured with metal bindings. The walls of the band room are covered with cork carpet, the ceilings with acoustic materials. An instrument storage room is placed between the two rehearsal rooms; a separate compartment is provided for each instrument so the instructor can check the instruments at a glance. A small office is arranged for each music instruc-

tor, and one of these is equipped for a music library. A series of small practice rooms is located near by, but not directly adjacent to the rehearsal rooms. These are likewise acoustically treated. Each rehearsal room has a compartment case for the storage of music in daily use. Steel lockers, 24 inches square and 72 inches high, are built into the walls of the corridors adjacent to the rehearsal and practice rooms for the storage of band suits and the robes of the a cappella choir. Separate toilets are provided. The music department is reached directly from one of the outside entrances leading to a stair and cut off by the rolling gate arrangement, elsewhere described.

This music department is closely co-ordinated with the drawing department and auditorium facilities both in location and use. Music is made an elective, available to students either as a recreational or major study. The facilities are made available to students during school hours and to community groups at other times. The goal sought is to make it possible for any student so desiring to devote to music any time and energies not otherwise occupied. If a student chooses to do his studying at home and devote extra time to music every day — well and good — the facilities are available and he or she is encouraged to do so. Pupils are not confined to what teachers or fond parents think they ought to study, but there is opportunity on every hand for the realization of interests and self-expression and the satisfactions and normality that result therefrom.

One set of home-economics rooms comprising a food laboratory, clothing laboratory, and housekeeping unit is provided in this building. The second set is to be housed in a practice



The carpenter shop with its ample balcony for storing lumber and students' projects is as attractive and well lighted as any classroom.

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The foods classroom has unit kitchens arranged around the outside walls with work tables and an instructional area in the center of the room. The finish, the window hangings, etc., strike a decidedly home-like and feminine note.



The typical classroom provides the greatest degree of informality. Walls have blackboards and tackboards, ample shelving for books and instructional materials. When steel cabinets are again available a teacher's closet will be provided for storing outdoor wraps, etc.

house where some of the teachers will live and where the actual housekeeping will be done by a section of the class. The cooking room in the high school building is laid out with unit kitchens, using one of the circular bays or the front of the building. These circular bays proved to make very desirable classrooms. The teacher in each case is located at the center of the circle so that the rooms become most convenient and very easy to supervise.

In addition to the usual lecture rooms and laboratories, the science department is equipped with a model layout of darkroom facilities for photographic work, similar to that used by commercial photographers. The trapped light arrangements permit several students to work in this space as no darkroom doors are required.

There is also a science museum where scientific apparatus in everyday use, such as communication devices, engines, motors, household appliances, and apparatus, can be placed on display for experimental purposes. The physics department has a small workroom equipped for student hobby work in the field of science. The biology department has, in addition to its conservatory fitted with large tile lined fishpool and extensive arrangement of exhibit cases, a complete taxidermy laboratory. This laboratory is located in the basement with separate entrance and is provided with special ventilation. Two hundred people elect work in this laboratory as extracurricular activities. The upper three stories of the tower are available for radio work and provision was made for mounting a telescope.

The clothing laboratory, biology, chemistry, and bookkeeping rooms are equipped for the tote system of handling the students' work. The drawers in each case are housed in built-in wall cabinets.

A storage room for three hundred bicycles is provided in the basement, reached at either end by ramps. Parking space is provided on

the school site for three hundred automobiles.

An attempt has been made to provide satisfying beauty and a variety of interest in design of all parts of the building. A strong, harmonious color scheme was first worked out for the long corridors, with colorful terrazzo floors and base, likewise for the stair and stair landings, all in simple patterns. Maroon enamel was selected for the color of the steel lockers set in a rich brown wainscot of 6 by 6-inch ceramic tiles. The color of these tiles was changed for the wainscot of each stairway, and to provide further interest the wainscoting of both corridors and stairways is enriched with figured tiles. These tiles were designed in the architects' offices; some are in series to illustrate a classic theme or story, others illustrate a sequence of events. There are more than four hundred different designs in these tile inserts and no two tiles are alike.

The oak woodwork is stained light, grayish brown. The ceilings in all corridors and classrooms are of light-colored acoustical materials. The colors from the corridors are carried into the adjacent classrooms but each classroom color scheme is varied somewhat by changing the color and design of linoleum floors and wainscots and by the differences in the design of the built-in cases and cabinets. The window sills, backs of drinking fountains, and wainscots of main vestibules are of colorful marbles.

No plaster or wood cornices, columns, or extraneous motifs of any kind were employed in the designs of either the exterior or interior. Every decorative feature is developed as a logical outgrowth of the architectural structure. All decorative features such as stone carvings, floor patterns, and lettered mottoes are integrated with the interests and education of high school pupils.

The following rooms are arranged to be cut off for community use by rolling doors which close across the corridors: offices, library,

auditorium, shops, music department, cafeteria and kitchen, gymnasiums, locker rooms, natatorium, scouts' room, taxidermy laboratory, janitors' work room, and a section of classrooms. Each room is provided with a separate heating and ventilating unit.

The classroom section of this building is constructed on the unit plan which provides for making changes in room sizes in the future as may be required by changing the location of the dividing partitions. A 4-foot air and pipe space is provided under the entire first-floor construction. This is increased to 8-foot height under the first-floor corridors to provide a work passage and pipe tunnel. The pipes and conducts are racked up on the sides and ceiling of this long tunnel so workmen can walk the full length without fear of intercepting pipes on the ceilings or floors.

The building, which cost \$1,500,000 including furniture and equipment, was occupied February 1 and dedicated February 24, 1943, with Dr. Alexander Grant Ruthven, president of the University of Michigan, giving the principal address in which he declared this to be one of the modern high schools of the world.

#### CONSTRUCTION AND EQUIPMENT DETAILS Sexton High School, Lansing, Michigan

Exterior, brick and stone trim.  
Paint products, Pittsburgh Plate Glass Co.  
Floors, classroom, linoleum, Congoleum-Nairn; gymnasium, maple.  
Boilers, Kewanee.  
Unit heaters and ventilators, Sturtevant.  
Temperature control, Johnson.  
Program clocks, International Time.  
Sanitary installation, Standard Sanitary.  
Washfountains in shops, Bradley.  
Blackboards, Weber Costello.  
Gymnasium equipment, Medart.  
Pupils' desks, American Seating Co.  
Stage scenery, Mork Green Studios.  
Cafeteria tables, American Seating Co.  
Furniture, physics laboratory, home economics, art rooms, drafting rooms, Hamilton Mfg. Co.; library, Library Bureau Division of Remington Rand; shops, E. H. Sheldon Company; print shop, American Type Founders.

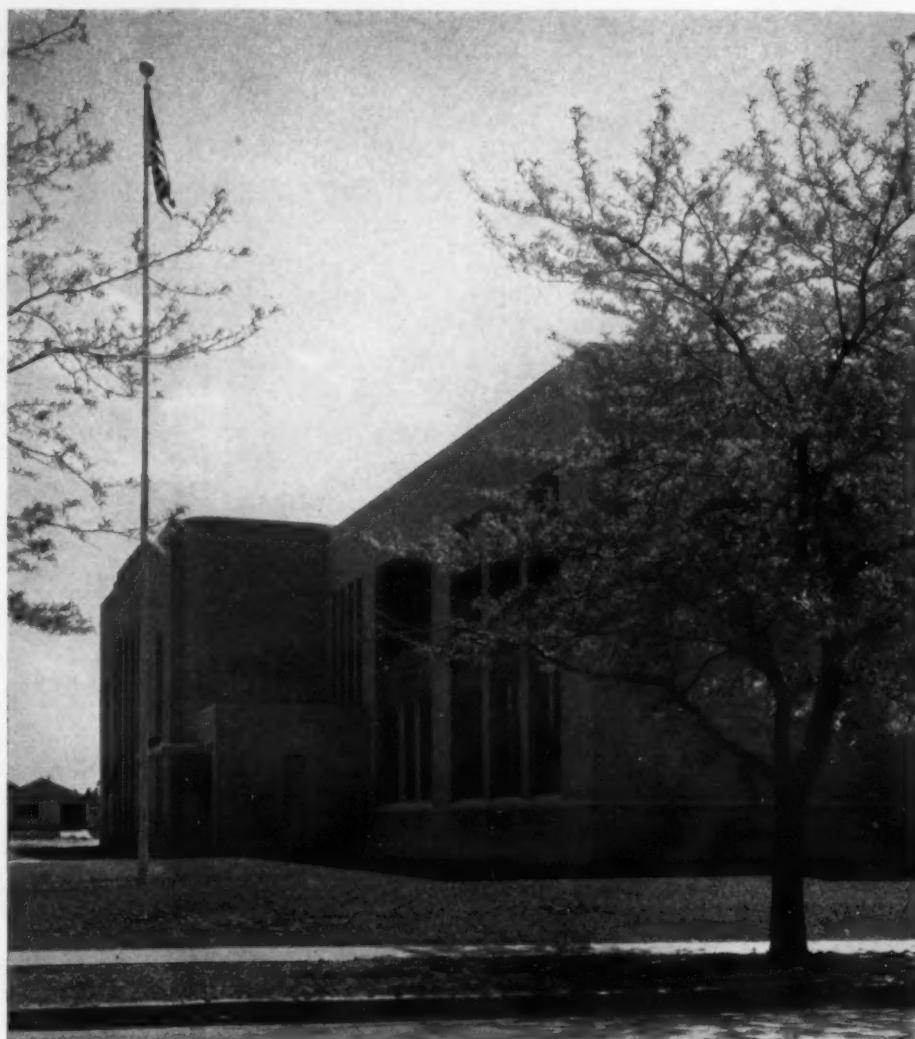
## New Elementary School Facilities in Denver Are Result of Increased Population

A. Helen Anderson<sup>1</sup>

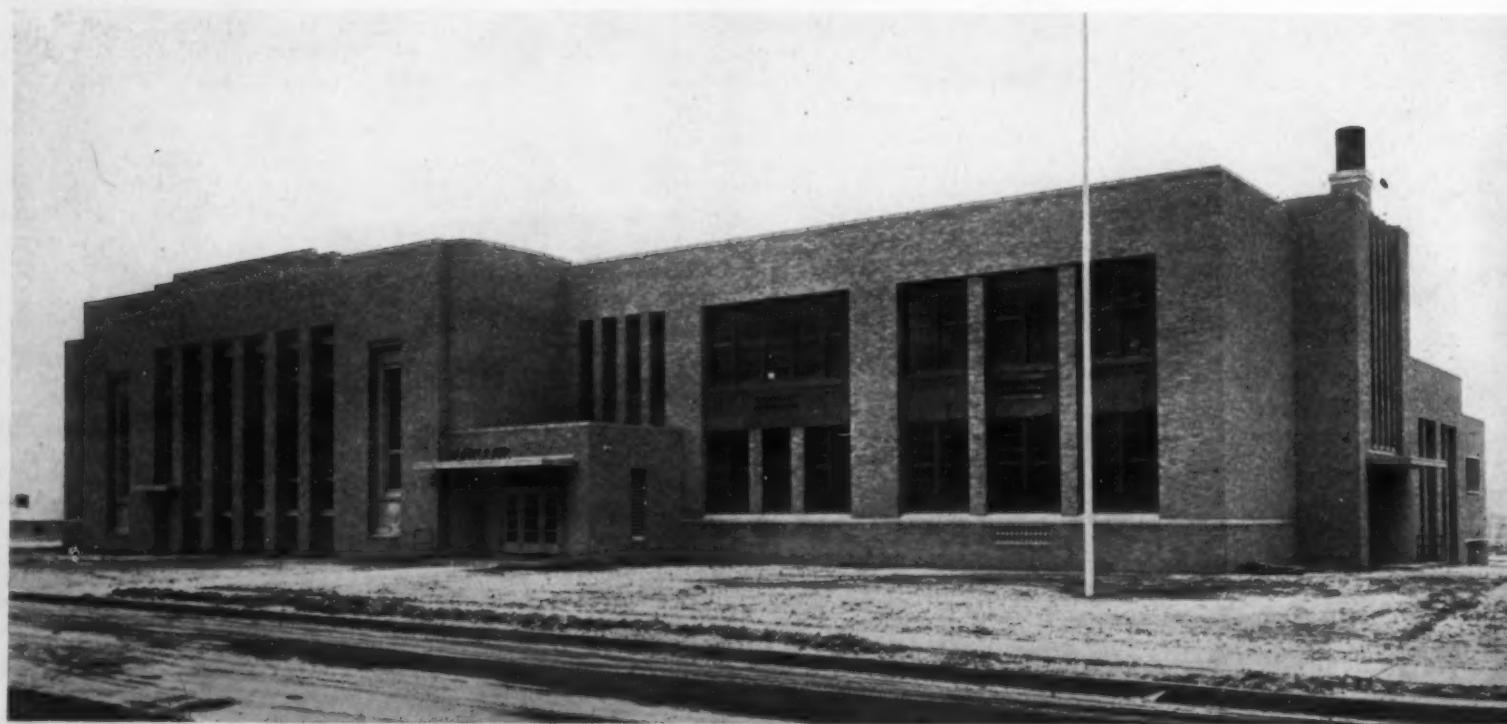
One new elementary school building and an addition to another school, a comparatively new elementary structure, have been added to the Denver school plant during the past year. The new structure is the Montclair School; the additions were made to the Steck School. Both school buildings are in the same growing section of the city.

The new Montclair School of Denver, just completed, fills a longfelt need in the community in which it is located. The old structure, erected in 1891, was obsolete and inadequate; hence, a new building for this community has been on the calendar of needs for many years. The time never seemed just right for the building of the new Montclair School until the program for national defense came along. The old building, located less than a half mile from Lowry Field, United States Army Air Force Training Command School, was suddenly strained beyond its capacity by the addition of several hun-

<sup>1</sup>Supervisor of Publications, Denver Public Schools.



Detail, Main Front, Montclair School, Denver, Colorado.



General Exterior, Montclair School, Denver, Colorado. — Gordon D. White, Architect, Denver, Colorado.

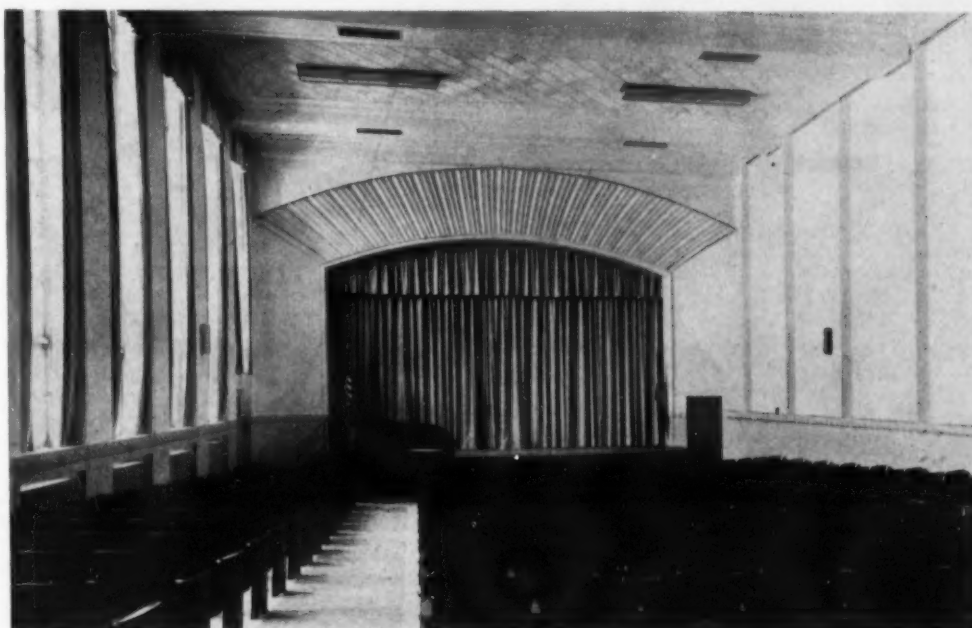


Left: a niche, Montclair School. Right: gymnasium wing of the Montclair School.

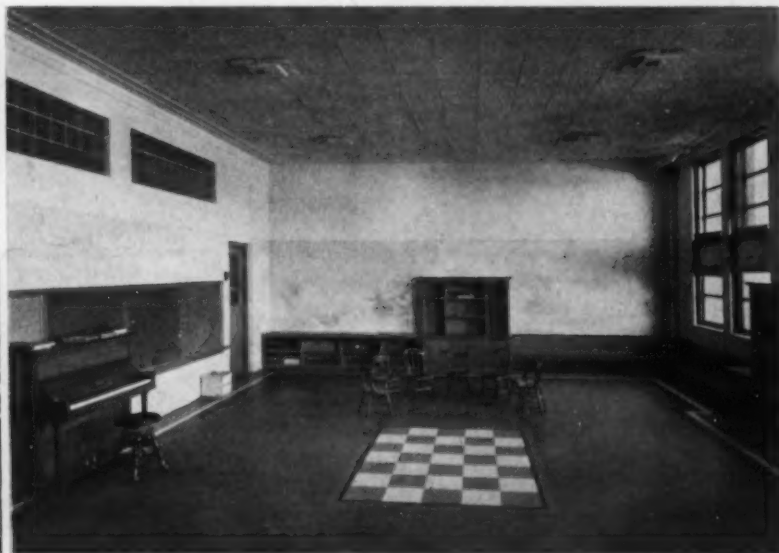
dred children who had come to Denver as a result of the increasing number of families living near the field. Obviously additional school facilities had to be provided. The United States government contributed through the Federal Works Agency the sum of \$66,150 toward the construction of the new school building, the total cost of which was \$225,000. The remainder of the cost was financed by the school district of Denver out of current funds.

The new Montclair School, in addition to meeting emergency needs of that community, answers the problems created by a rapidly developing residential district. The homes, parkways, and boulevards of that vicinity make for one of the most attractive sections of the city. The new school building fits into the general environment in such a way as to enhance the beauty of the district.

What is more, many community organizations are already making use of the auditorium. In fact, a church group holds Sunday services in the building, pending the erection of their own structure.



Auditorium of the Montclair School.



Left: the cafeteria is the only room in the basement of the Montclair School. Light lunches only are served. Right: the kindergarten has attractive murals extending around the four walls and illustrating Mother Goose stories.



Gymnasium, Montclair School, Denver, Colorado.

With the opening of the fall term of 1943, it has been found that, in spite of the new building, it is necessary to reopen some rooms in the old building because of still further increases in the number of children living in the Montclair community.

Constructed of light color brick, the exterior of the new Montclair School is conservatively modern. A maximum amount of light is achieved by the large windows and glass brick panels. The whole building is designed on simple lines that make for easy care. There are 12 classrooms, including 2 kindergartens, a gymnasium, an auditorium, a library, storage rooms, and a lunchroom. The school has a normal pupil capacity of between 500 and 600 children.

Some of the features of the new Montclair School are the following:

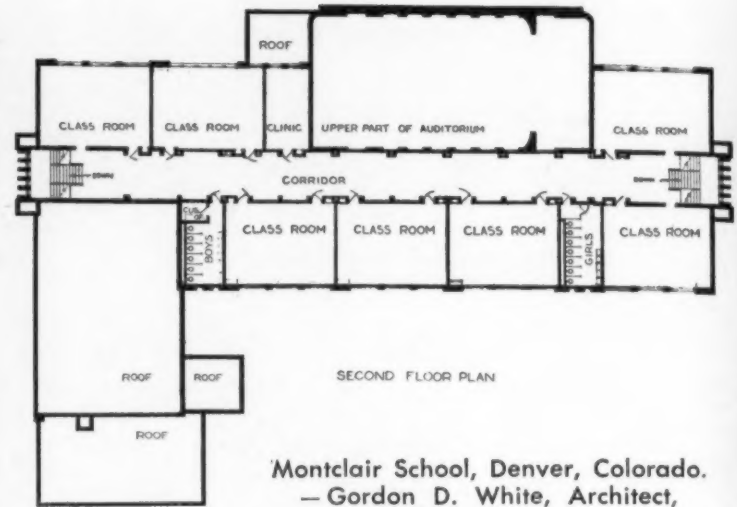
1. The structural design is that of brick-bearing walls with reinforced concrete tile joist floors, reinforced concrete interior supporting columns, and reinforced concrete roof.
2. The floors of classrooms and gymnasium are maple, laid over concrete slabs. The only

other wood used in the building is that of the oak doors and cases.

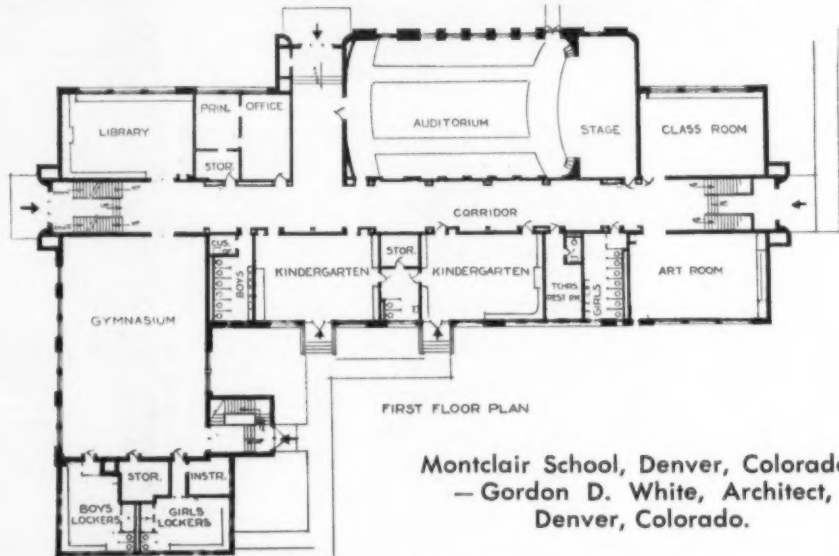
3. The auditorium has acoustical walls, acoustical tile ceiling panels, and a separate ventilating system. Floodlights from the audi-

torium ceiling take the place of footlights in the stage lighting.

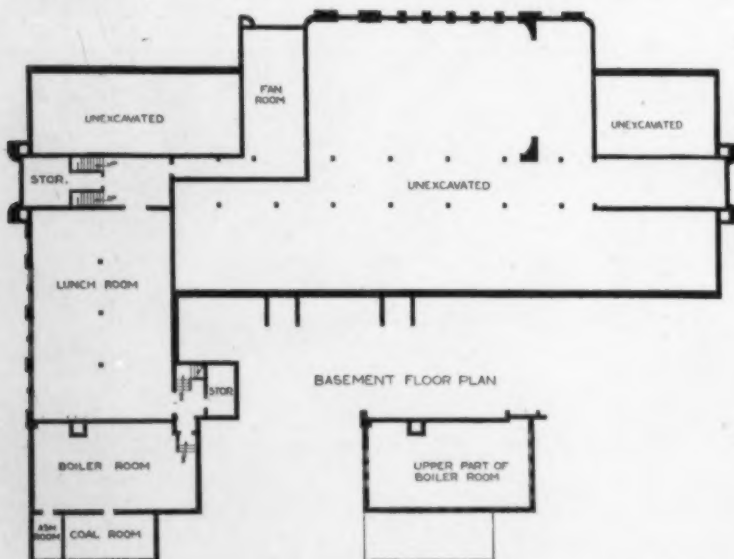
4. The gymnasium has acoustical ceiling treatment and a separate heating and ventilating unit.



Montclair School, Denver, Colorado.  
— Gordon D. White, Architect,  
Denver, Colorado.



Montclair School, Denver, Colorado.  
— Gordon D. White, Architect,  
Denver, Colorado.

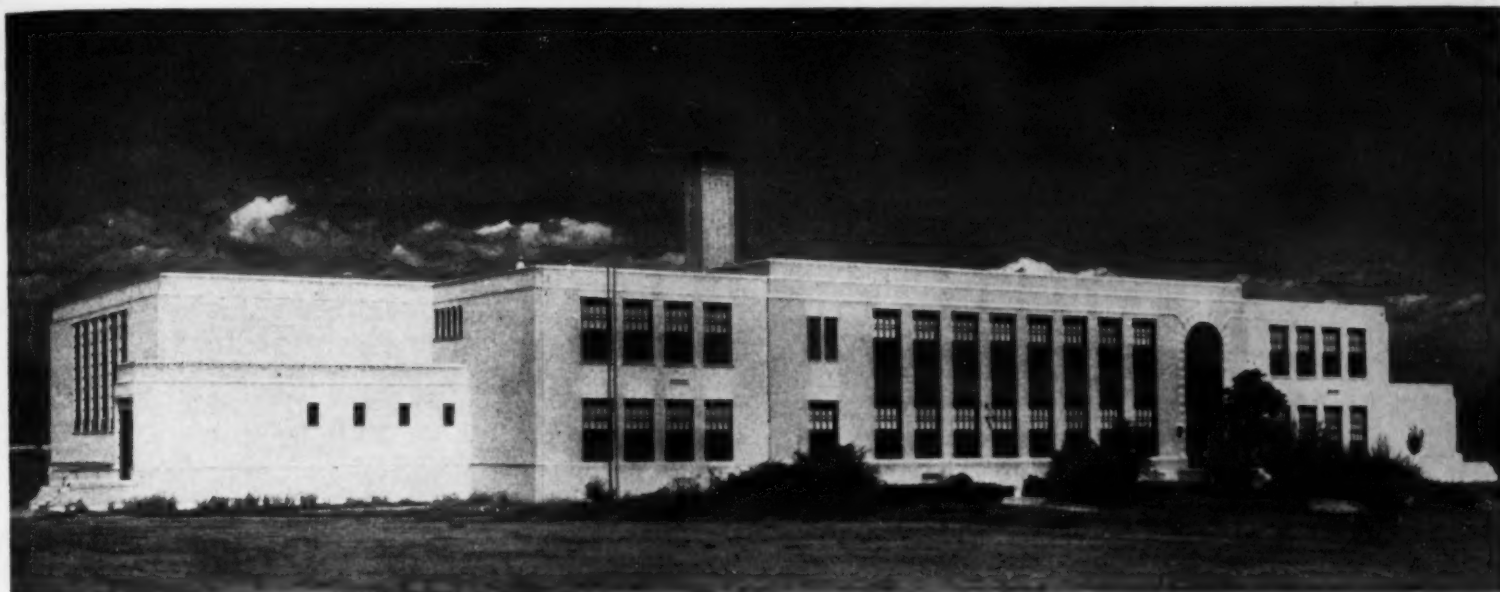


Montclair School, Denver, Colorado. — Gordon D. White, Architect, Denver, Colorado.

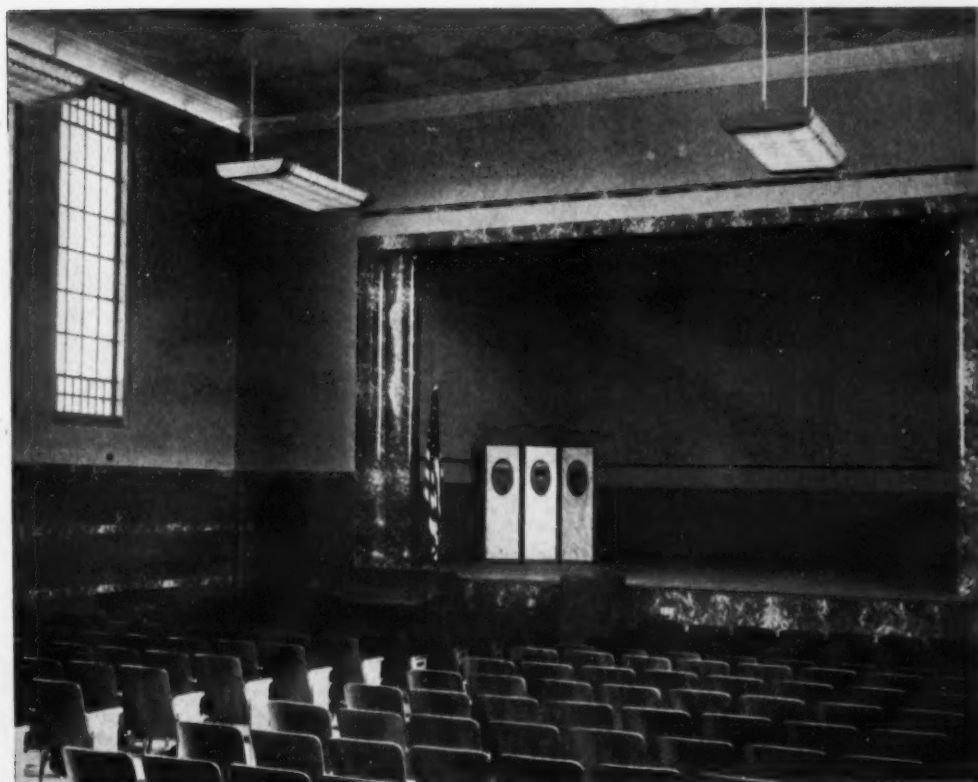


A typical classroom in the Montclair School showing the use of hardwood maple floor, tile wainscoting, and natural slate blackboards.

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General Exterior, Steck School, Denver, Colorado. The wings at either end were completed in 1943.



The auditorium of the new addition to the Steck School, Denver, Colorado.

5. Typical classrooms are 24 feet by 32 feet. Each has a storage closet and a teacher's cloak closet.

6. Each classroom is provided with unit heaters and direct radiation. There are book-cases under all windows.

7. The art room and the library have acoustical tile ceilings.

8. The two kindergarten rooms have their own storage space, cloak rooms, and toilet facilities. These rooms also have acoustical ceiling treatment. The walls are decorated with murals illustrating Mother Goose stories. These murals are the work of a local artist.

The floors of the kindergartens are covered by linoleum with inserted designs.

The architect for the Montclair School was Gordon D. White of Denver.

Approximately a mile away from the new Montclair School is the Steck elementary school, built in 1931. The same factors that brought about the planning and erection of the Montclair School—a new residential district and the expansion of Lowry Field—made it necessary in 1942 to build new wings at both ends of the Steck School.

The Steck School had been constructed in the first place with the idea of these future



The library in the new addition to the Steck School is a delightfully friendly room.

additions, and the architect for the original building, S. Arthur Axtens, made the plans for the additions. At a cost of \$129,857, also financed from current funds of the school district, there were added a gymnasium, an auditorium, six classrooms, and a lunchroom, thereby increasing the capacity of the school from 300 to 600 pupils. Construction, equipment, and general design follow that of the original building.

#### SCHOOL BOND SALES

During the month of November, 1943, school bonds were sold in the amount of \$2,057,700.

During the same period, refunding bonds and short-term paper were sold in the amount of \$716,000.

The average interest rate was 1.82 per cent.

#### SCHOOL-BUILDING CONSTRUCTION

During the month of November 1943, Dodge reports that contracts were let for 93 educational buildings, at a valuation of \$3,323,000.

In 7 states west of the Rockies, not included in Dodge, contracts were let for 12 new school buildings, to cost \$882,000. Eleven additional buildings were reported in early stages, to cost \$1,630,300.

# The U. S. Coast Guard Builds Training Station for Petty Officers

Thomas H. Creighton<sup>1</sup>

The United States Coast Guard has constructed a station for the training of petty officers on the site of a former estate close to one of the busiest harbors on the east coast, under the direction of the Civil Engineering Division, Coast Guard Headquarters. Plans were developed by Alfred Hopkins & Associates, architects and engineers, New York, and the general contract for construction was carried out by the Vermilya-Brown Co., Inc., New York. A group of structures built under wartime conditions provides for the advanced training of Coast Guard enlisted personnel which will qualify them for petty officer ratings in the service.

The buildings were planned not only for academic training, but also to allow actual shop practice, as well as military training and discipline. Classes are conducted in radio communications and signaling; special courses are given for yeomen, electricians, carpenters' mates, machinists' mates, firemen and water tenders; and space is provided for teaching cooks, bakers, and pharmacists. In addition to these facilities, the Coast Guard Institute was established in a separate building, to make correspondence courses available to Coast Guard enlisted personnel, as well as to reserve officers. This will give the enlisted personnel an opportunity to improve themselves for the securing of better ratings during wartime, and provide a definite program

<sup>1</sup>Of the firm of Alfred Hopkins & Associates, Architects-Engineers, New York City.



Main entrance to the dormitory group, U. S. Coast Guard Training School for Petty Officers, Avery Point, Groton, Connecticut. — Alfred Hopkins & Associates, Architects, New York City. Decorative marble at the entrance, on the roof parapet, etc., was provided from available decorative marble found in the formal garden on the original estate.



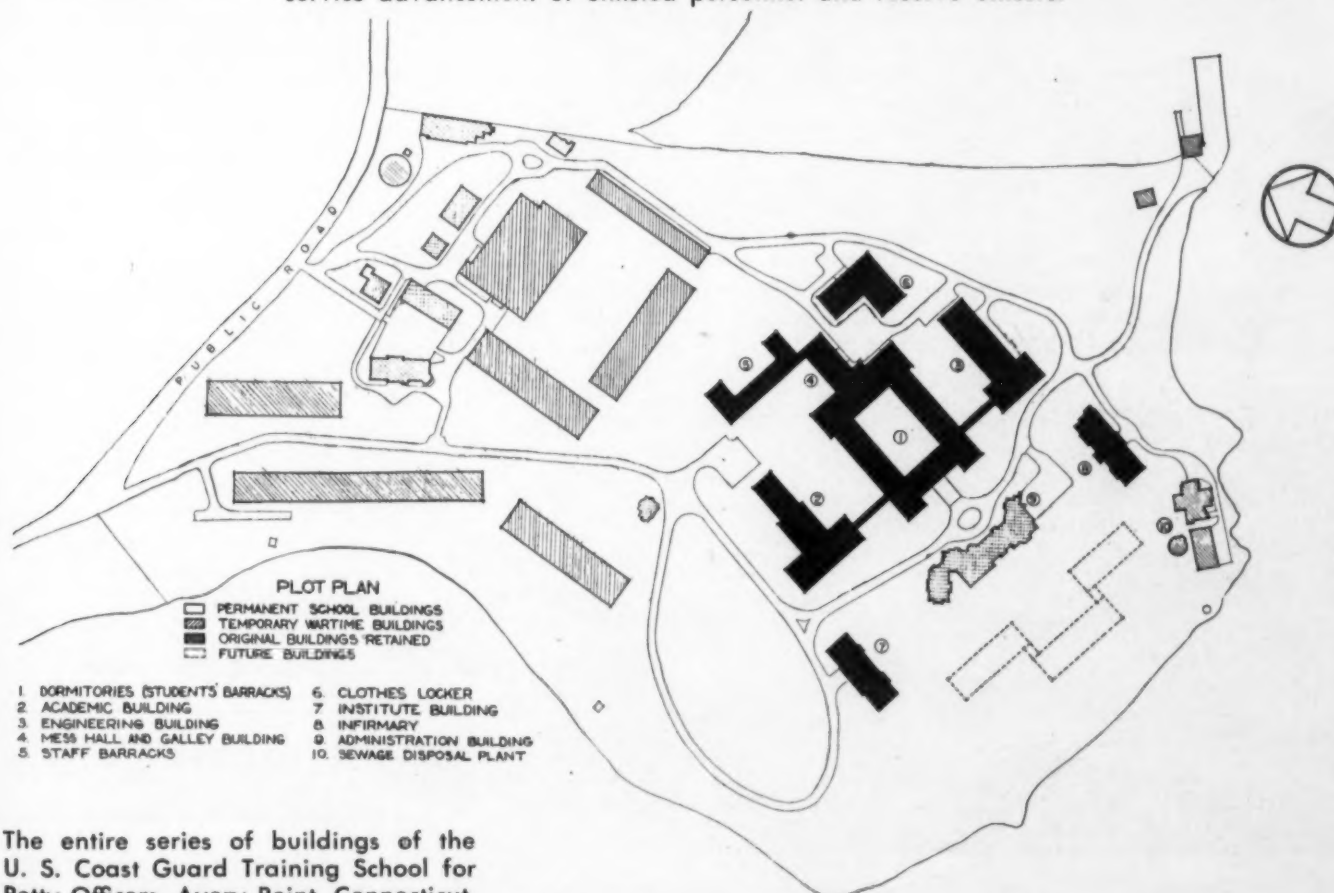
The mess hall of the school is attractive in equipment and finish. It seats 1000 men who may be served simultaneously on cafeteria plan.



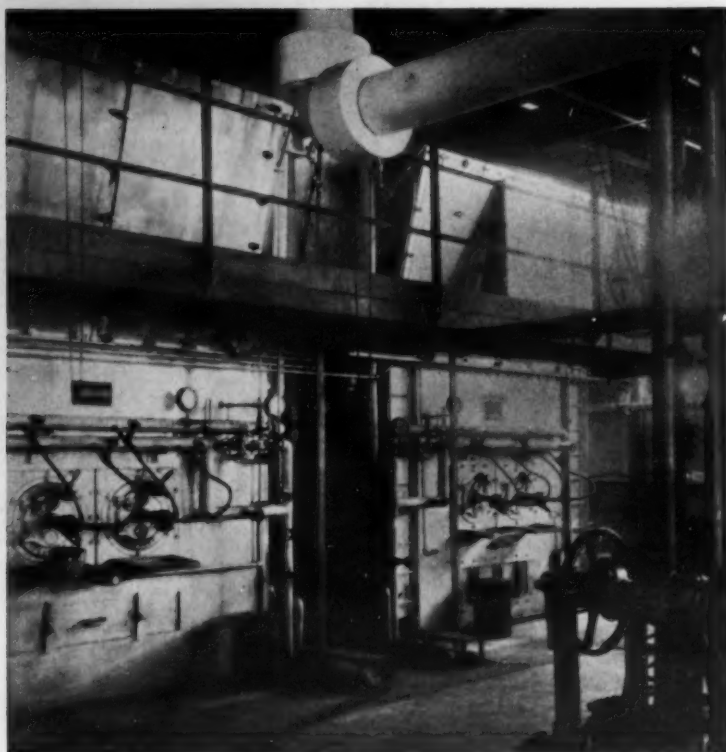
The machine shop in the Engineering Building is carefully equipped with machinery and tools which students will find in the typical coast guard establishments. The instructional work is entirely practical.



The Coast Guard Institute Building of the U. S. Coast Guard Training School for Petty Officers at Avery Point, Groton, Connecticut. In this building extensive correspondence courses are made available for the personal and service advancement of enlisted personnel and reserve officers.



The entire series of buildings of the U. S. Coast Guard Training School for Petty Officers, Avery Point, Connecticut, has been planned for maximum service during the present emergency and for a reduced permanent student load in peacetime.



The boiler rooms in the Coast Guard Training School are of the type used on the latest liberty ships. They serve for instructional purposes.



The auditorium of the academic building is widely used for instructional as well as recreational purposes.

for the training of reserve officers on inactive status in peacetime.

A U-shaped dormitory building—the "Students' Barracks"—and the mess hall building form a quadrangle which is the central unit of the group. Covered passageways lead to the academic building on one side and the engineering building on the other. A staff barracks housing 224 "crew" members—maintenance, guard, galley staff, and instructors—projects beyond the mess hall. Between the barracks building and the water lies the administration building—the old mansion house of the estate, remodeled—and flanking it are the Coast Guard Institute building on the west and the infirmary and pharmacists' mates' school on the east. It is intended

eventually to demolish the administration building and extend the group toward the water to form a quadrangle with additional buildings about a parade ground, the eventual administration building heading the entire group. The orientation of the buildings is such that practically every classroom gets east or west light. Adequate space made it possible to group the various buildings with sufficient room between and around them so that good light and ventilation are obtained everywhere.\*

#### The Buildings

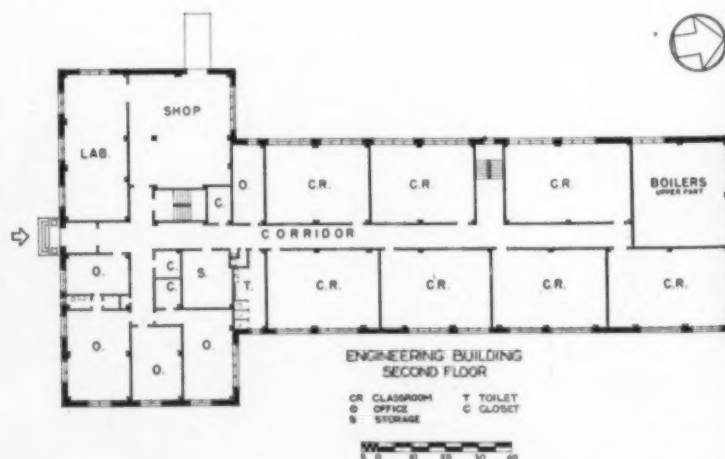
The dormitory building provides rooms accommodating two men each, with ample space for their beds, study tables, and chairs.

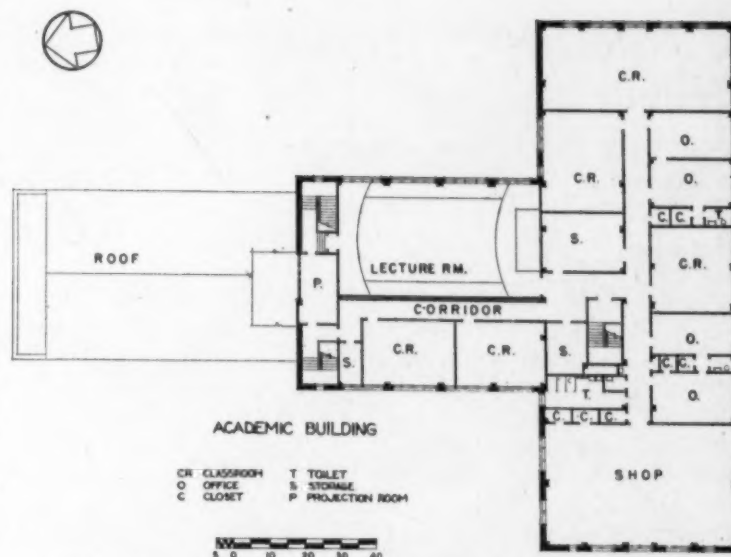
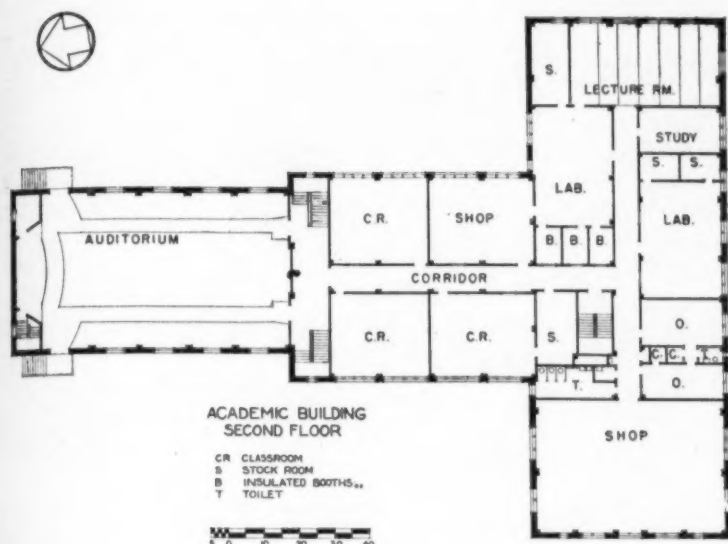
Between pairs of rooms built-in "lockers," closet size, form the dividing partitions. This arrangement was saving of both space and building materials. Group toilets and showers are provided for each wing. Large study rooms have corner locations, while offices are centrally located. On the lower floor there are tailor and barber shops. Eight-foot-wide corridors lead to the engineering and academic buildings.

The engineering building, a T-shaped structure, houses on the ground floor carpenter and machine shops, with a large steam laboratory projecting from the boiler room. Here students study the operation of marine boilers, and by means of a steam header extending through the demonstration room are able to connect and study in operation marine engines and pumps of various types. Another room is devoted to the study of



Corner of the main workroom where yeomen are trained in the clerical work needed by the service.





Third Floor of the Academic Building. The plan has been carefully studied for adequate light and circulation and for maximum economy of space.

internal combustion engines. On the second and third floors there are classrooms and administrative offices.

The first floor of the academic building was planned principally to house the radio communications school. One room is arranged to set up transmitters; another to install receivers, giving an opportunity for study in actual practice. In another space the basic materials laboratory—the sets can be broken down and their mechanics and materials studied. On this floor there is also an armory with an adjacent lecture room for instruction in the handling of small arms. Throughout this building all study topics have been related to a group of rooms—basically a shop or practical demonstration room, a classroom or lecture room, and a stock room, where the large demonstration units can be kept completely assembled.

On the second floor of the academic building there is a navigation classroom, several smaller classrooms, a large lecture hall, and a laboratory for electrical study, with adjacent booths sealed and shielded from electrical interference. The third floor includes a large instruction space for yeoman training, various classrooms, and another lecture hall not as large as the one on the floor below.

The combined infirmary and pharmacists' mates' training school is a completely equipped 40-bed hospital, with out-patient (sick-call) rooms on the first floor. Having its own separate entrance, there is a students' section set off for the schoolwork, with a classroom large enough for 25 study tables and a study laboratory equipped with chemistry tables. On the second floor are wards, the necessary service rooms, and an emergency operating suite.

The Coast Guard Institute building contains all the necessary workrooms and administrative offices connected with a correspondence school, where a wide range of technical and cultural courses are made available to all men in the service. On the ground floor there is a large post-office space, a complete printing establishment, a photographic department, and binding, sorting, packing,

and storage rooms. Above are the offices and a huge general room where the administrative work is carried on.

The mess hall and galley building is arranged to feed 1000 men—the entire complement of the station—by cafeteria service. A carefully studied system of circulation allows the men to enter, collecting their eating gear, pass the food service counter, and get to their tables. When they have finished eating, they may leave without any cross traffic or confusion. Ample food-preparation space with good lighting and ventilation is provided in the galley. Circulation and function have been carefully studied.

#### Construction

Since the training station was conceived during peacetime conditions as a permanent facility for the service, and construction was carried on at the beginning of the war, it was necessary to curtail the use of critical materials, and at the same time provide structures as permanent as possible. The solution which Alfred Hopkins & Associates evolved was a concrete frame—posts, girders, piers, and grade beams—with enclosing walls of concrete block. The block was laid to form a double wall, with a 2-inch air space. A finished exterior surface of great interest was obtained by using an irregular surface texture and several color tone variations in the blocks, and laying them in 4, 6, and 8-inch courses with random vertical joints. In this way a permanent wall surface was obtained, which has an interesting character, is extremely inexpensive, and does not use scarce materials or crucial transportation facilities. Even the labor was noncritical, for masons were more readily obtainable than other skilled workmen.

The interior surface of the wall is in almost all cases simply paint on smooth-faced concrete blocks. Where a washable and dust resisting finish was desired, as in toilets and washrooms, salt-glazed block was used. Thus

all plaster was eliminated and labor and materials were saved, while a more than satisfactory finish was obtained. Floor finish generally is linoleum, with terrazzo used in the toilet, shower, and galley spaces. Through most of the corridors as well as the rooms, an acoustical ceiling finish was formed by laying sheets of compressed wood-fiber insulation on the forms before the concrete slabs were poured. Thus when the forms were stripped away, the acoustical sheets were an integral part of the construction and needed only to be painted.

#### Mechanical Equipment

The oil-fired high pressure boiler in the engineering building, as mentioned before, not only supplies steam for heat and for the kitchen equipment, but is used for instruction purposes as well. The two-pipe steam-heating system is controlled independently and automatically for each building by an outdoor thermostat which regulates the steam supplied to each building in accordance with outside temperature.

The lecture rooms and many of the classrooms, which are equipped with lightproof shades for the use of visual-education projection apparatus, are heated and at the same time provided with a tempered air supply by unit ventilators. Large open spaces, such as shops and recreation rooms, are heated by down-blow type unit heaters rather than radiators, one factor in their use being conservation of critical cast-iron radiation material.

The sanitary drainage system extends from the buildings to a sewage disposal plant which was built on the site. Rain-water drainage is led off to the bay. All plumbing fixtures are the most sanitary obtainable, and were installed with heavy back plates and hangers in order to withstand the inevitable rough usage. Liquid soap systems were provided in all toilet rooms.

(Continued on page 66)

## THE AMERICAN School Board Journal

A Monthly Periodical of School Administration

Edited by

Wm. Geo. Bruce and Wm. C. Bruce

### Better Schoolhouses

THE stoppage of school-building construction since Pearl Harbor has given school authorities an opportunity to undertake valuable planning programs which will be translated into new buildings after the cessation of hostilities when construction materials and personnel are again available. It will be a full decade before the possibilities of the present planning will be fully realized and before the progress in education and in school plant facilities which usually follow a major war will be clearly seen and appreciated.

The planning programs in numerous cities relate to educational reconstruction antecedent to the erection of new buildings. And this looking forward to educational change and to improved instructional services is supremely important if the democratic objectives for which we fight are to be achieved in a lasting peace. Unless the individual and the mass of American people are educated for spiritual and cultural levels not previously achieved, and for bettered social and occupational efficiency, we shall not be able to maintain the peace internally, nor in relation with our empire-seeking allies or our totalitarian enemies. The planning in cities and states is not merely giving school boards and their executives a better perspective on their building needs in relation to the educational program, it is also affording them a chance to cooperate closely with municipal planning authorities and to harmonize and step up recreational, health, child-care, and social welfare services shared by several public agencies.

Since the outbreak of the war the powers that be have by-passed the Office of Education so often and so harmfully that little hope can be held out for more than limited federal advice and counsel in the planning or effectuation of postwar building programs. Active thinking and direct action must begin and be carried along on the state and local levels. In fact, the local school boards must carry, as they should, the real burden of the job. Lucky is the school district which has set its financial house in order and paid off its outstanding bonds so that it can go before the voters with a clean slate and ask for needed bond issues. A remarkably large number of urban areas have built up cash reserves

that will make their financing problem a bit more easy when the war-to-peace transition causes a heavy tax squeeze. In all school-plant planning close attention will be necessary to the changing economic situation. The battle for the taxpayer's dollar will be increasingly severe.

In the plan and design of school buildings, it appears possible that a sharp break with tradition will come after the war. Dr. Bursch's paper, on another page, shows what is happening in California where classroom layouts and lighting have been radically altered, where the layout of buildings and the relation of parts to the whole are being changed on utilitarian and logical bases, and where the exterior design has broken away from conventional notions of balance, of monumentality, and of academic adaptation of historic styles. That similar departures are possible, even in the cold northern climates, is evidenced in the Crow Island School, Winnetka, and in various war-plant schools, e.g., the Willow Run schools at Detroit.

It seems desirable that the layout, plan, and design of schoolhouses in small cities and rural areas become increasingly different from those of large cities. There has been altogether too much aping of the large cities which have difficult problems of site and access. The city school building of the future will continue of necessity to be a compact, multi-storied, high cost, formal building. Whether these city schools can be built of inexpensive, fireproof materials, to last a comparatively short time—say 25 to 35 or 40 years—is an unanswered question. But the small town need not be hampered by large city difficulties. Cheap land is always available in the small town to make possible one-story, open-plan buildings, erected of comparatively low cost materials. A few wealthy suburban communities should lead in the development of new, desirable rural and small-town types of schoolhouses.

School boards who are holding back in their planning because they anticipate radical improvement in materials of construction and in mechanical and sanitary equipment, are acting unwisely for the simple reason that startling changes are not probable. The war has not encouraged invention in the building industry, except for the development of certain substitutes which are largely untested and at best cannot pass economic scrutiny when compared with established materials. Full information on the newest available roofing, wall, and flooring materials are in possession of architects and can be used in present writing of specifications.

Any current school-plant planning that overlooks the need of rehabilitating old

buildings is perfectly futile. The large cities have both elementary and high school buildings that are structurally sound and that can be fully adapted to the activity method, to the new types of organization, and the new subjects. In the past, the trouble with much school remodeling has been the failure to make changes for instructional convenience and to piddle along with floor and wall repairs, electric and plumbing replacements, heating repairs, and fireproofing. True, all these things are needed, but they are secondary to the job of making a building fully efficient for the new school program and attractive to the child eye.

The year 1944 may not see many new school-building enterprises under way, even though the WPB has lessened its restrictions on repair and remodeling jobs. But the year should be memorable for planning and timely anticipation of growing needs.

### School Housekeeping

A RECENT release of OWI calls attention to the fact that numerous old factories have the benefit of better housekeeping than some of the newest plants boasting the finest and most modern in lighting, heating, and sanitation. A survey made by the Women's Bureau of the U. S. Department of Labor showed that many new factories are not nearly so desirable for women workers as are the old buildings in which adequate facilities have been provided for the comfort and health of workers. True, the old buildings lack forced ventilation and are not equipped with the newest types of lighting. The fenestration is distinctly old fashioned but the total effects are satisfactory to the workers because the buildings are kept up. They are clean, the rest rooms are sanitary, and other arrangements contribute to make the workers happy. Some of the new buildings are overcrowded and there is too much dependence upon mechanical ventilation and other gadgets which are expected to make unnecessary the simple daily care and attention to cleanliness, means for removing dust and fumes, etc.

It is to be feared that a similar situation can be found in numerous school buildings, particularly in buildings erected in recent years, where it has been assumed that the finish of walls and floors, new models of plumbing fixtures, and the newest types of ventilating apparatus in classrooms and particularly in toilets, will take the place of daily attention to cleanliness and other good housekeeping practices.

A sixty-year-old school building can be fully as healthful and satisfactory as the newest structure in glass, tile, and concrete so long as the housekeeping is perfect.



## *Scholarships* FOR 10 FUTURE ENGINEERS

Here is an unusual opportunity for high school seniors who have the ability and energy to become leaders in engineering.

Each year, ten outstanding young men are selected to participate in a five-year program which includes a full engineering course at Carnegie Institute of Technology, plus the equivalent of two years of practical experience in Westinghouse plants.

Because of the urgent need for engineers in the armed forces and in industry, the normal program has been shortened to cover the accelerated course now in effect in all engineering colleges. Under this plan, students attend Carnegie in the summer as well as during the regular year. Work assignments at Westinghouse plants are temporarily suspended.

If you have, in the graduating class of your school, any boys who have the qualifications for

these scholarships, your teachers should advise them to write for application blanks.

If they can meet the entrance requirements of the College, they will be accepted for consideration. Final selections are based on applicants' general ability, engineering aptitude and qualities of leadership.

Scholarship winners do not make any agreement to enter Westinghouse employment after graduation, nor does Westinghouse promise to provide employment.

Applications for George Westinghouse Engineering Scholarships must be received on or before February 1, 1944. For application blanks or further information, students should write to Manager of Technical Employment and Training, Westinghouse Electric & Manufacturing Co., 306 Fourth Ave., P. O. Box 1017, Pittsburgh (30), Pennsylvania.

**Westinghouse**  
Plants in 25 Cities Offices Everywhere

## New York City Plans for Postwar Schools John E. Wade<sup>1</sup>

New York City has set up a postwar construction program, with a total estimated cost of \$700,000,000. This program will provide employment for a quarter of a million men. The city already has provided for the expenditure of approximately \$25,000,000 for final plans and specifications, and the 1944 Capital Budget adds to the program by providing additional planning funds for proj-

<sup>1</sup>Superintendent of Schools, City of New York.

ects already adopted, and \$3,500,000 for studies, plans, and specifications for new projects, the estimated cost of which is approximately \$73,000,000.

New school buildings will comprise a large part of the program. Upon the adoption of the 1944 program there will be 73 school projects, with a total estimated cost for buildings and sites of \$91,000,000. The appropriation for final plans and specifications for these projects is \$3,500,000.

### *Planning for the Future?*

That's what thousands of school executives and architects did during the past quarter-century when they specified Spencer Vacuum Cleaning.

Now these schools are just as clean as before the war — regardless of the tremendous day and night use of the schools and the fact that many experienced janitors have been replaced — frequently by women.

And these schools have both a low cleaning cost and a low replacement and repair cost.

Your next school will last longer if you keep it clean. Students will have higher morale, more healthy conditions. It's the simplest form of school insurance you can buy.

We offer our assistance to school boards and architects making plans for the future now.



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**CLEANING**  
THE SPENCER TURBINE COMPANY, HARTFORD, CONN.

In addition to this, there is a state-aided postwar program of public works. Education will participate in this for playgrounds for existing schools, to an estimated cost of \$1,500,000, plus \$46,000 for planning.

The necessity of completing these plans so that they may serve as a reservoir of work ready for letting of contracts when peace comes required the engaging of private architects for some projects. These private architects were selected from the New York City panel after consideration of their experience and other relevant items. Of the 73 projects in the postwar program 17 are already completed, 14 are to be completed by the board's bureau of construction, 29 by private architects, while 13 have not been assigned.

Not only will the program compensate for the cessation of construction due to war activities, but it will also provide for replacement of obsolescent buildings. Forty-seven of the projects are replacements.

The nature of the projects is of interest. In the list may be found the restoration of the original building erected in 1787, of the Erasmus Hall High School now on the grounds of the school. There are new buildings for the promotion of vocational education. Ten are general vocational schools. Education for aviation is provided for by the Wilbur Wright High School of Aviation Trades, to be located on LaGuardia Field, and a replacement of the present Aviation Trades High School. There will be replacements of the Food Trades High School and the Maritime High School, for training in leading New York City industries. Industrial Art and Specialty Trades are also provided for by replacements. A new Building Trades Vocational High School appears in the program.

Extension of the junior high school program is another feature of the program. Ten buildings will be constructed for this purpose. The remainder of the projects are elementary schools, mainly replacements. There will be, however, a number of additions to existing buildings, and a number of new buildings to provide school accommodations in sections which have outgrown present facilities.

The projects are part of a long-range building program of the board to provide facilities required to meet modern educational and community needs. The completion of the program will further enhance the position of the city of New York in the educational world.

#### **Baltimore's Postwar Building Program**

Prior to the war a \$10,000,000 bond issue for school buildings was approved by the voters of Baltimore. It was not expected that all of this money would be expended in a short period, but the total authorization would permit planning on the basis of a total program, with successive steps toward its accomplishment.

The various projects are in different stages from those where nothing has been done to those for which final plans have been drawn. Additional sites are being acquired and various studies made in order that the program can be pushed more vigorously when the time seems opportune.

Semimonthly meetings of the administrative staff, under the leadership of Dr. David E. Weglein, superintendent of schools, are being held to discuss postwar conditions as they may affect the educational program and in turn the building program. It is recognized

(Continued on page 54)

**SCHOOL SUPERINTENDENTS!**  
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JERSEY CITY, NEW JERSEY  
 JEFFERSONVILLE, INDIANA

KANSAS CITY, KANSAS  
 BERKELEY, CALIFORNIA

(Continued from page 52)

that the kind of building and the facilities to be provided must be determined in the light of the proposed educational program.

At the same time we are studying our building standards, particularly in view of our past operational and maintenance experience. — *John W. Lewis, Assistant Superintendent.*

#### Boston Prepares Five-Year Postwar Program

BOSTON, MASS. The city contemplates a postwar school-building program, to cover five years, and to cost \$6,000,000. It will include

(1) an addition to the Boston Trade School, (2) a replacement for the Girls' High School, (3) an annex for the Mechanic Arts High School, (4) three intermediate schools, (5) replacements for five elementary schools, and (6) four additions, one for a high school, one for an intermediate school, and two for elementary schools. — *Arthur L. Gould, Superintendent of Schools.*

#### Cleveland Plans 16 Buildings

CLEVELAND, OHIO. While there is no immediate possibility of carrying out any construction of buildings, the school officials have prepared a tentative list of school-building

needs in response to a request from the Federal Security Agency. The program is being rechecked and will be presented to the board in the form of an Annual Housing Report.

The program, as set up, includes 16 new buildings and additions, to be constructed at a total estimated cost of \$16,000,000. The program includes (1) a new junior high school, (2) a new trade school for boys, (3) remodeling of a school for elementary use, (4) an addition to a junior high school, (5) improvements at two vocational schools, (6) an auditorium-gymnasium at an elementary school, (7) additions to five elementary schools, (8) an addition to the technical high school, and (9) two special rooms in senior high schools. — *Gerald E. Irons.*

#### Columbus Plans Three New Buildings

COLUMBUS, OHIO. We have a comprehensive school-building program, which includes three new buildings, two additions, and the modernization of 32 older elementary buildings. The modernization program provides for fireproofing, new heating plants, assembly rooms, modern sanitary systems, improved lighting, cleaning equipment, and related improvements. As the first step immediately after the close of the war, we are in the process of preparing the working plans and specifications for the modernization program for 12 buildings. — *G. E. Roudebush, Superintendent of Schools.*

#### Cincinnati Schools Embark on First Step

CINCINNATI, OHIO. We have embarked upon the first step of a postwar school-building program. The school board has authorized an extensive and complete building survey, with the objects of (1) meeting our needs for school buildings, (2) providing for the modernization of old buildings, (3) meeting the needs for extensions to sites and playgrounds, and (4) providing for the abandonment of obsolescent buildings.

The survey, now under way, will involve in addition, a statement in broad outline of the postwar program of education for which facilities are needed, an analysis of changes, developments, and trends in school-building design and building materials. The survey will be completed by next spring. — *Claude Cowter, Superintendent of Schools.*

#### Dallas Schools Issue Bonds

DALLAS, TEX. The public schools of Dallas have made definite plans for a postwar building program. Bonds have been issued for the construction of an elementary school of 15 rooms, a Negro elementary school of 18 rooms, and a junior high school of 24 rooms. Under the master plan, now under way, it is anticipated that there will be two junior high schools and four elementary schools — three for white pupils and one for Negro pupils. — *Julius Dorsey, Superintendent of Schools.*

#### Des Moines Schools Plan Postwar Program

DES MOINES, IOWA. The board of directors of the independent school district is co-operating with the Greater Des Moines committee, the city council, and other interested groups in taking first steps toward plans for necessary construction work during the postwar period. In August, 1942, the board compiled a list of projects for expanding and

(Continued on page 56)

## Your new postwar school can give them JOBS



Millions of fighting men are going to need jobs as soon as this war is over—*right after the shooting stops*, not months later.

Many communities—yours may be one of them—want new schools as soon as possible to correct overcrowded conditions that now exist.

Two separate problems, yes—but they can be solved to a great extent as one. For the new school you hope to build can provide jobs for many of the boys who return to your community.

The important thing is that those jobs be ready *immediately* after the war. That calls for planning now. For, only if you

have the blueprints on the shelf, the building site secured, and the finances worked out, can your new school provide the *extra* benefit of immediate jobs for returning service men—as well as workers who leave the war plants.

Fortunately, many architects and engineers now have the time to help you. In fact, many of them can now give your ideas more time than they will be able to in the scramble of postwar building.

If your school board is not yet making postwar plans, point out to them the important *double* benefits to your community in getting their plans under way at once.

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### Schools are taking these steps to meet the demand for trained operators

Making better use of machines during regular classroom hours; providing additional practice periods and short courses for special and postgraduate students.

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Using the most modern practice texts and teaching materials; improving training procedures so students may attain a maximum of skill in the shortest time.

Teaching the up-to-date office machine short-cuts and operating techniques used today in war industries and government offices.

Making a wider range of skills available by increasing the number of elective courses which provide machine training

Business machines are more important today than ever before because of the tremendous wartime volume of figuring and accounting work.

So schools—public and private—are training more students on business machines than ever before . . . and still the demand for trained operators increases.

Whether the program adopted provides only a general acquaintance with machines, or develops varying degrees of operating skill, increased emphasis on machine training in the classroom directly serves the war effort by providing more workers for war offices.

The Burroughs Educational Division offers you, as a free wartime service, tested suggestions for enlarging operator training programs, and up-to-the-minute information on newest operating techniques, practice programs, texts and materials.

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ADDING, CALCULATING, ACCOUNTING, BILLING, PAYROLL AND STATISTICAL MACHINES  
NATION-WIDE MAINTENANCE SERVICE • BUSINESS MACHINE SUPPLIES

(Continued from page 54)

modernizing the physical plant of the school district over a period of 25 years.

Subsequent to the approval of this rather comprehensive list, Mr. Perry LaRue, director of buildings and grounds, and Assistant Supt. W. C. Findley, made a rather complete study of all projects in order to determine their relative importance. On the basis of information available at the present time, a total of eight projects have been selected for early consideration. These projects consist of a junior high school, two elementary buildings, an addition to a junior high school, and additions to four elementary schools. The administration has been authorized to confer with firms of architects regarding the preparation

of plans in the near future. — *N. D. McCombs, Superintendent of Schools.*

#### Postwar School-Building Program in Houston

HOUSTON, TEX. The city is in the midst of planning for the postwar period. Various committees have been at work for some time. We, like a great many, are trying to foresee certain of the emergencies which will place new responsibilities upon the schools in the postwar period. New courses and, perhaps, additional schools are being planned, whether of high school, technical, or college grade. Involved in the program are new facilities and new types of classrooms.

Houston has grown very rapidly, due to the increase in war industries. The school census

has shown more than 6000 additional students in the elementary schools. Several million dollars will be required to provide buildings and other educational facilities for this growth and to provide new types of buildings for the postwar program.

One of the big problems is the restoring of good teachers for those who have gone into the armed forces. Houston will welcome back its many teachers in the service, of whom there are nearly two hundred. — *E. E. Oberholtzer, Superintendent of Schools.*

#### Indianapolis Studies Population Trends and Building Needs

INDIANAPOLIS, IND. A study of public school population trends and school-building needs, with a view toward postwar construction of additional facilities where needed, has been started by a building committee of the Indianapolis board of school commissioners. The committee, which is headed by Mr. Theodore L. Locke, a member of the school board, has turned its attention first to population trends and building needs on the south side of the city. The committee is making a study of population trends and possible future transportation facilities of that area. It will locate the residences of present and future high school pupils of the area and will show pupil population of the present and future in the south central portion of the city. It will study the estimates of public utilities companies on population growths and trends during the next ten years. The possible effect of the new location of a south side high school on attendance will also be considered.

The building committee is engaged in a study of elementary population and building needs throughout the city. Many population shifts have occurred because of the construction of new residential sections during and prior to the war. School buildings which are overage are obvious subjects for study. Many of these buildings are located in older parts of the city and are just outside the mile square area which was the original city.

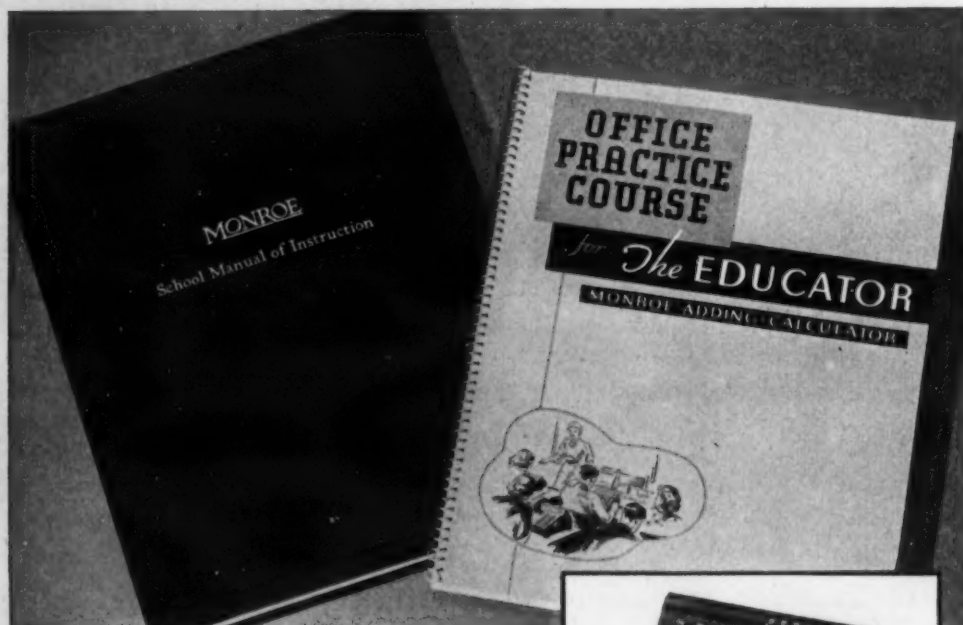
The birth rate per thousand of population will also be a factor to be studied. It has been shown that the trend of total school enrollment in the city is closely correlated with the trend in the birth rate of previous years. Since 1933, the birth rate has risen almost constantly, from 14.6 per thousand to 23.7 in 1942. Because this rise has been uniformly distributed over the past ten years, it is obviously not the result of local population changes because of war industries. The school officials expect an increase in the school population and an increased average daily attendance, to bring about a total school enrollment which will tax the capacities of most of the present buildings, and possibly result in overcrowding in some areas. — *William A. Evans, Director of Publications.*

#### Improvements Planned

MADISON, WIS. In 1942, the board of education presented to the long-range program committee a list of prospective needed building improvements, some capital and some maintenance, to cover a six-year period extending to 1948 or later. The total of these requests amounted to \$767,000 and included such items as redecorating, playground surfacing, improvement of gymnasium facilities, acoustical treatment, and additions to existing buildings.

(Continued on page 59)

## Wartime Conditions call for COMPLETELY TRAINED OPERATORS

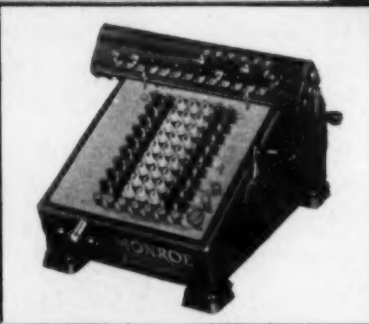


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It was different before the war; a business house could give time to finish the training of men and women who had received a general business training in school—today the need is for those who can step in and produce at once with a specific skill.

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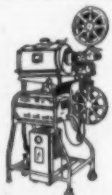
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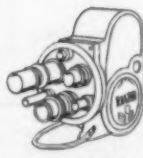
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8mm. Camera



Filmo TODA  
16mm. Camera

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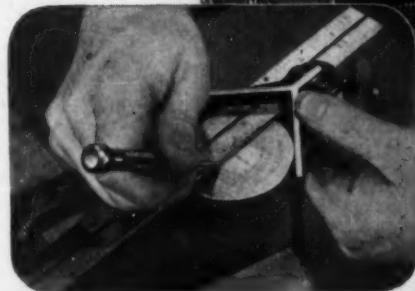
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## WHY TYPING TEACHERS GROW GRAY—*By Summers*



(Continued from page 56)

**Philadelphia Formulates Program**

PHILADELPHIA, PA. We are in process of formulating a building program for the period following the war, that is, we anticipate such a program, if conditions cause the Federal Government to enter into some kind of co-operative financing of building costs. Otherwise, we expect to stretch our proposed program over a period of several years.

We anticipate that the program will involve not only a large number of new school buildings, but a remodeling of many existing buildings. We hope, also, to enlarge our playgrounds. In making alterations of existing buildings, and in the construction of new buildings, provisions will be made for the wider community use of school facilities.—*A. J. Stoddard, Superintendent of Schools.*

**Pittsburgh Schools Plan Modernization Program**

Pittsburgh is typical of a number of large cities, in which a declining elementary enrollment appeared during the early thirties. The decline in high school enrollment in Pittsburgh started in 1940 and would have begun then even without the impact of the war. Although we naturally expect some increase in enrollment after the war, we do not anticipate a very large increase, and we are basing all of our plans on the thesis that we shall never have as many pupils enrolled as we have had in the past.

Our building program is, therefore, largely one of modernization and replacement rather than of expansion. We have had a considerable number of elementary buildings today in which the enrollment is approximately 50 per cent of capacity. We are anticipating a continued trek to the suburban and rural areas adjoining Pittsburgh and do not plan any extensive development of new sites or buildings.

The building department, under the direction of Mr. M. M. Steen, superintendent of buildings, is considering the possibility of constructing buildings less costly and less permanent since, under existing conditions, it seems unwise to plan to construct a building to be used for the next fifty or one hundred years.

We have named a postwar education planning committee, composed of educational staff members, which will be enlarged later, and this committee will recognize the extension and enlargement of educational services in certain new areas. We shall, undoubtedly, construct new buildings and additions to old buildings, and complete remodeling jobs during the postwar period, but under the conditions, we are not rushing our plans and at this moment, at least, do not intend to rush into a building program at the immediate close of the war.—*Henry H. Hill, Superintendent of Schools.*

**School-Building Planning for After the War**

ST. LOUIS, MO. The board of education of the city of St. Louis has appointed a committee to study postwar plans from the standpoint of curricular changes and public works program.—*Philip J. Hickey, Acting Superintendent of Schools.*

**St. Paul Begins Plans for the Postwar Period**

ST. PAUL, MINN. Some time ago, we were asked by the Mayor's office to suggest tenta-



**JUST HOW MUCH** would you pay to have the nerve-jangling noise demons banished from your school buildings once and for all . . . to be rid of the din of youthful footsteps, of exuberant voices, of dishes in the cafeteria? What would it be worth to provide your faculty and student body with the quiet atmosphere that aids concentration? Whatever you'd pay, it's probably more than a ceiling of Armstrong's Cushiontone will cost.

Cushiontone's deep holes—484 in each 12" x 12" unit—give it a noise-quieting factor as high as 0.75. This high efficiency is permanent, unaffected even by repainting with ordinary materials and methods. Cushiontone is an excellent light reflector, too. And it's quickly installed.

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tive postwar plans for school buildings with the idea that there will be a federal public works program after the war is over. In general, this was our estimated need: Quite a number of our buildings are in great need of repair and renovation. I think this will be the first need that we have as far as buildings are concerned.

A second need we have been thinking of is a school shop. At present we have an old building which is neither adequate nor satisfactory.

A third need we have recommended for several years is a planned program to replace some of the older buildings and to combine some of the smaller school districts. There are several places in the city where we could

build, and with some redistricting, could take care of two or three districts in one building. The thing that has prevented this consolidation of districts is the poor location of the buildings and in some instances their inadequacy.

A fourth need is for buildings in one or two districts which are not being adequately served by the present schools on the elementary level.

A fifth need is for a boys' and girls' trade and technical high school.

In St. Paul we have a large geographical area in terms of school population and we are trying to make larger school units. We are planning our high school needs in terms of vocational and trade education and in terms

of the building of parochial schools. — *P. S. Amidon, Superintendent of Schools.*

#### San Francisco Plans Formative

SAN FRANCISCO, CALIF. The public schools have their plans for postwar building still in the formative stage. They do intend to start rather soon on the preliminary planning for school-building needs. In general, they do know already what these needs are, but it is planned to develop a comprehensive program for the entire city rather than building in terms of single units. — *Julius E. Warren, Superintendent of Schools.*

#### Seattle Elementary School Program

SEATTLE, WASH. The Seattle public schools have carried on careful population surveys for a number of years.

On the basis of information available, it appears that Seattle will be confronted with a need for substantial elementary construction during the postwar period. The trough of the enrollment is in the fifth grade during the present semester. In the secondary schools such school construction as will be needed should not be the enlargement of present facilities but will be limited to newer communities in which there has been a substantial growth during the war boom. — *Lyle Stewart, Administrative Assistant.*

#### Jersey City Plans New Buildings

JERSEY CITY, N. J. We are planning for the replacement of three old buildings, and the erection of one new elementary school building. — *James A. Nugent, Superintendent of Schools.*

#### Postwar Program of Newark

NEWARK, N. J. In November, 1942, a committee of Newark principals was appointed to study the building needs of the schools, and to make recommendations for supplying these needs through a postwar building program. The program was to concern itself with (a) new building construction, (b) remodeling or rebuilding of existing inadequate buildings, and (c) the acquisition of additional land for school purposes.

The principals' committee, during the school year 1943, carried on an intensive study, and on July 20 made recommendations concerning new school-building needs, proposing the erection of six new buildings as follows: (1) The Dayton Street School, (2) South Western High School, (3) Northern Section Senior High School, (4) Ironbound Section Junior High School, (5) Occupational School for Boys, southern section, and (6) Occupational School for Girls, northern section. The plans for one of these schools — the Dayton Street — have been completed.

The board has filed with the U. S. Office of Education six completed copies of "Form I, School Building Needs by Individual School Buildings" covering all of these schools. The board of commissioners of the city of Newark has listed with the state budget director the proposed estimate of a postwar building program, costing \$49,000,000, for the city. Included in this amount is \$10,500,000, earmarked for new school construction or old school improvements.

The committee is continuing its study and expects to have recommendations shortly, covering the renovating and rebuilding of at least 15 older buildings, sections of which are today obsolete. — *John S. Herron, Superintendent of Schools.*

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### THE POSTWAR SCHOOL-BUILDING PROGRAM OF THE LOS ANGELES CITY SCHOOLS

Vierling Kersey<sup>1</sup>

The Los Angeles schools have suspended all building activities for the duration of the war. With a population increase of well over 200,000, it has been necessary to resort to many devices for the housing of children. In some cases children are transported long distances to schools where vacancies exist, and in other cases, there has been extensive redistricting without transportation. Many bungalows and portable units have been brought into use. There will be a great need for construction at the expiration of the war.

<sup>1</sup>Superintendent, Los Angeles City Schools.

Undoubtedly the major item of construction will be in new elementary school buildings. Enrollment in kindergarten and elementary schools this year is approximately 14,000 above that of last year and the majority of these new students are in areas where few permanent buildings existed. It will probably be necessary to provide from 500 to 700 new additional classrooms in the next five years, not only to take care of the increase but because of the larger number of children who were born in the community.

Absence of all replacements will also make it necessary to spend between three million and five million dollars on replacement and rehabilitation as soon as construction becomes possible. To this must be added the completion of many plants, on some of which construction was about to start in 1941.

In planning for the period after the war, two items seem to have particular significance. One is the large number of children in pre-school age, which is estimated to be 40,000 greater than the number of children in the primary grades at present. This assures us of large elementary schools for several years to come. It also appears almost certain that a large number of men returning from the armed forces will place a heavy strain on the schools above high school level. Vocational schools and adult education will undoubtedly set new records.

An extensive program was filed with the Public Works Reserve about two years ago and is now under revision. At least forty sets of detailed plans have been completed or are under preparation so that it will be possible to start work on certain projects as soon as materials and money are available. If funds were available, it seems probable that construction work amounting to five million dollars per year will be needed for the Los Angeles schools for at least three years after the termination of the war.



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### MONTANA SCHOOL BOARDS DISCUSS WAR PROBLEMS

The Montana School Boards Association, at its meeting in Helena, on December 6 and 7, discussed war school problems and considered means of building up emergency funds for the continuation of construction programs through the use of present surpluses.

On Monday morning, F. E. Young, of Helena, talked on "The Teachers' Retirement Act." In the afternoon, C. W. Baum, of Livingston, spoke on the subject, "A Constitutional Amendment to Change Distribution of State Income and Interest Fund," and Oscar Baarson, of the War Production Board, discussed "Priorities and the Public Schools." V. F. Gibson, of Great Falls, called upon the members to determine definitely now what their postwar problems are to be. He indicated that many Montana school boards have appointed committees to make surveys of their programs as they fit the communities.

On Tuesday, Miss Elizabeth Ireland, state superintendent of schools, addressed the members, speaking on the development of specialized training. She presented the delegates with an explanation of state school finances. Fred Bennion also gave a talk on "Public School Finances," and Fred Robinson called for a new setup, suggesting that "we need more schools like those in Helena and more leaders like Bill Fahrner." The governor gave a talk in which he praised the work done by the state public schools for their work in vocational training of men and women for essential industry and called upon them for more in the postwar world. A. T. Peterson, director of the Office of Price Administration, stressed economic stability and the part the schools can play.

The Association voted to oppose a constitutional amendment designed to give the legislature power to determine the method of distribution of the income and interest fund. The subject of new legislation was brought up and it was suggested that a bill be brought before the legislature to continue the revenue from SB 148, which has increased high school revenue 10 per cent.

Mr. E. H. Newell, of Livingston, was elected president; Floyd Young, Helena, was named vice-president; and J. L. Gleason, Livingston, was elected secretary to succeed himself.

### NEWS OF OFFICIALS

► LAWRENCE M. BAGGS has been elected as a member of the school board of Cheyenne, Wyo., to succeed W. R. Grier, who resigned.

► ANTHONY CAMPAGNA has been appointed a member of the board of education of New York City. He succeeds Dr. Alberto C. Bonaschi.

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### Minneapolis Appoints Committees

MINNEAPOLIS, MINN. Two special committees have been named to begin work on the problems which will confront the schools in the postwar period. One committee will consider the educational needs of the school system in the postwar period and the steps to be taken to meet the needs. The other committee will study the needs for new construction, rehabilitation, repair, and maintenance of buildings.

### Milwaukee Plans for Five Years

MILWAUKEE, WIS. The city from time to time, over a period of twenty years, has had the services of a five-year building and Future Sites Commission, which has sought to keep before the board a well-considered program

for its guidance in planning school buildings and choosing school sites. Recently, the board directed that the commission renew its labors with a view of determining the buildings and sites needed by the city for the next five years. The commission, which is made up of two members of the board, a city planning engineer, the secretary-business manager, the architect of the board, the director of municipal recreation and adult education, and two assistant superintendents, is expected to make its report about March 1.—Lowell P. Goodrich, Superintendent of Schools.

### THE SELECTION OF SCHOOL SITES

Dr. N. L. Engelhardt, head of the New York City board of education division on schoolhousing, recently described the care which school and city authorities exercise in the selection of sites for new school buildings. The site must serve a

certain section of the city. It must be located within reasonably close walking distance for elementary grade children or within good transportation access for pupils of the secondary school grades. It must be of sufficient size to provide for a building of reasonable height to house the necessary facilities and to provide for adequate outdoor play space. It must be economical from the standpoint of initial cost of land and of normal cost of construction.

The first step in the selection of a school site is the inclusion of the project in the six-year building program. No site may be selected unless it appears in the capital budget.

Preparation of the six-year building program involves research on questions of congestion due to the development of new home areas and replacement of obsolescent buildings.

After the capital budget is approved, attention is given to the selection of sites. Information is furnished on the type of site needed, the source from which the pupils will be drawn, the existing schools affected, and other projects being considered.

Public hearings are then held by the planning commission with the board of education. The city bureau of real estate then invites offers of sale of land. The board's division on housing inspects the areas, studies the valuations, and other pertinent data, and then makes the alternate selections.

The members of the board from the borough involved inspect the proposed sites and the park department is consulted so that there is no conflict with its playground program. A preferred site and an alternate are then decided upon by the board of education, which sends its choices to the board of estimate. Where necessary, the president of the borough is consulted.

The board of estimate then refers the school board's recommendations to the planning commission, the bureau of real estate and the budget director. The board of estimate, if it approves, authorizes the acquisition of the site and the sale of bonds to cover its cost.

Up to the present, the procedure has been followed in the acquisition of more than sixty sites. Most of these are for schools to be built after the war.

### SIX MILLION PERSONS TRAINED FOR WAR INDUSTRIES

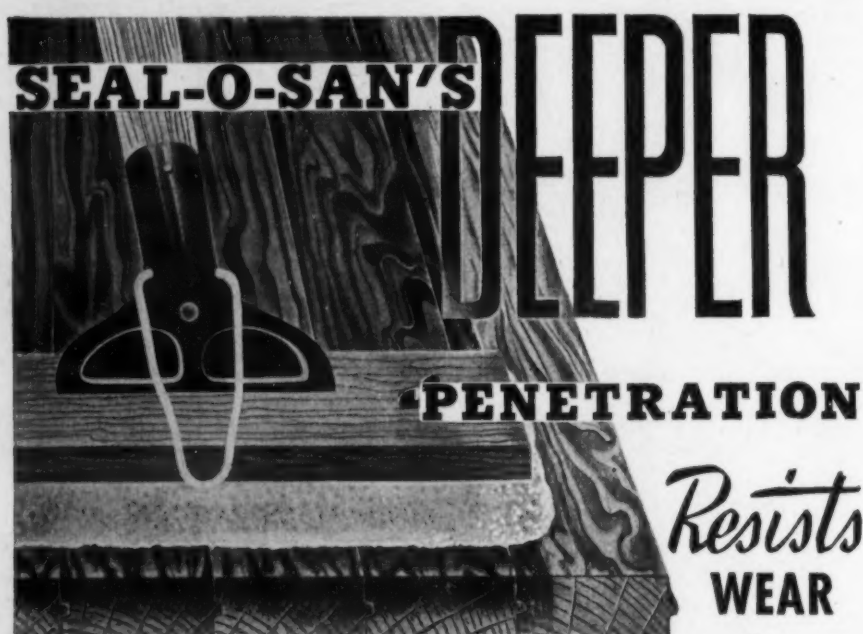
A total of six million men and women have been given training since July 1, 1940, under the program of vocational training for war-production workers, according to a report made public by L. S. Hawkins, director of vocational training for war-production workers, and J. C. Wright, Assistant U. S. Commissioner for Vocational Education.

The total number of warworkers trained in the public vocational schools represents more than one quarter of all workers employed in war-production industries at the peak of the production. The training program has aided in the production of aircraft, ships, tanks, and ordnance, and has included civilians and enlisted personnel of the armed services. More than 65,000 civilians were trained for the U. S. Army Signal Corps.

Approximately one million women have been given training in courses designed to prepare them for scores of occupations essential to war industries. Almost one third of the war-production trainees attending courses in the public vocational schools are women.

In addition to providing break-in training for new workers, tens of thousands of workers in plants have been given upgrading training to prepare them for new jobs or additional responsibilities. In many instances, the schools have set up actual production-line training programs either in the schools or in the war plants.

One of the major responsibilities of the U. S. Office of Education and state boards of vocational education has been the development of efficient training for industrial supervisors. Approximately 500,000 industrial supervisors have been given foreman training and job instructor training courses. The purpose of these courses has been to develop better understanding.



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## School Administration in Action

### FORT LAUDERDALE SCHOOLS REVISE COURSES

During the school year 1943-4, the courses in the high school of Fort Lauderdale, Fla., were revised, to include new courses in war mathematics, applied physics, and preflight training. The physical-education program has been extended to provide 300 minutes of work per week, with emphasis on the program recommended by the U. S. Office of Education.

During the first semester, Spanish and mathematics enrollments have increased about 50 per cent, with no increase in enrollment. This has been attributed to guidance work, recommending emphasis on these two subjects.

The schools are using a large amount of films in connection with the several courses. The schools are finding more and more visual material suited to subjects in the curriculum.

The student council has directed bond rallies, has conducted air raids, and inaugurated scrap drives. Students willingly perform any duties connected with the war effort, with the possible exception of extended effort in academic subjects.

### NEW COURSES IN BURLEY, IDAHO

The school board of Burley, Idaho, has inaugurated a number of new courses for the school year 1943-44. During the year, physical-education courses are being offered to boys and girls in the junior and senior high schools. Health instruction has been made a part of the program, with four instructors giving full time to the work. A large playfield adjacent to the buildings and a gymnasium provide facilities for health instruction classes.

During the school year, an eight weeks' course in truck and auto driving is being offered to high school students during the winter season. The course is designed to promote safe driving and to train drivers for the armed forces.

The board has extended the facilities to provide better instruction in industrial arts for the 300 boys taking this work. An organized program of work in mechanic arts and agriculture is being offered, including work in carpentry, drawing, welding, metalwork, and farm machine repair.

### NEW MARKING SYSTEM IN BARRINGTON

A special committee of the school board of Barrington, R. I., has completed a study of the marking system in the high school. The committee has recommended that there be five letters in the marking system, namely A, B, C, D, and E. The committee has recommended that no attempt be made to judge effort or attitude for the purpose of recording numerical definitions of these traits, but any serious failure on the part of a pupil to give the proper effort or to show the proper attitude must be investigated. The committee will study further the more complicated aspects of the problem relating to the mechanics of the evaluation of pupil achievement so that the recorded marks will be reliable and valid.

### NEW ACTIVITIES IN COLORADO SPRINGS

The board of education of Colorado Springs, Colo., at the recommendation of Supt. Roy J. Wasson, has inaugurated new courses in geography, Spanish, and home nursing. The course in geography for the sixth grades comprises a year's study of Central and South America, giving particular attention to the life and customs, literature, music, and arts of the people of the Latin American countries. The course on the eastern hemisphere has been transferred to the seventh grade in the junior high school as a part of the social studies work.

The Spanish course in the ninth grade is a beginning study of the Spanish language. It replaces Latin in two of the junior high schools

where the Latin enrollment had fallen off. The study of Latin at the senior high school level will be resumed in order to meet college requirements.

The course in home nursing for girls has been established in conjunction with the Red Cross branch. It is being taught on a laboratory basis and is open to all senior girls in the high school. An elementary course of similar nature is being offered to girls of the eighth grade in all junior high schools.

In addition to these, the board is cooperating in sponsoring a recreation program for youth of all ages during out-of-school hours. A summer program was conducted in the summer of 1943 on playground and building sites of the various schools. A similar program for the winter season is being offered, including both outdoor and indoor recreation facilities for afternoon, after school, evenings, and Saturdays.

The board is sponsoring, with the aid of the Lanham Act funds, a child-care program in sev-

eral sections of the city. Each of these centers accommodates two classes of children, at different age levels, involving programs for nursery pupils and older children.

► Greenwich, Conn. A committee for public interpretation has been named by the public schools to cooperate with the local teachers' association. The high school students, under the direction of the audio-visual education director, are showing 16mm. films for community organizations and service clubs. A "lunch box" derby was held recently, in which the children of the grade schools competed in arranging the best lunch. The contest was held during the "Food Fights for Freedom" week. During the fall, the students were given chest X rays. This is the second year that the students were given X rays in a campaign to discover tubercular cases and to teach preventive measures.



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## Teachers' Salaries

### THE NEPTUNE TOWNSHIP SALARY SCHEDULE

The board of education of Neptune township, at Ocean Grove, N. J., took action during the school year 1943, which resulted in the adoption of a salary schedule, giving the teachers increments for the year 1944 and granting them also a bonus of \$150 each. This schedule is an amendment of a previous schedule adopted in January, 1943, and is intended to give teachers additional opportunity to work toward higher salaries based on training and experience.

Under the schedule, teachers with less than two years' training will be paid a minimum salary of \$1,300, and will receive annual increments of \$50 up to a maximum of \$1,800 to be reached in ten years. Teachers with two years' training will be paid the minimum salary and will receive annual increments of \$70 up to the maximum of \$2,000 reached in ten years. Teachers with three years' training will be paid \$1,400 and will receive annual increments of \$85 up to a maximum of \$2,250 at the end of ten years. Teachers with four years' training will be paid a minimum of \$1,500 and annual increments of \$100 up to a maximum of \$2,500 at the end of ten years. Teachers with five years' training will be paid \$1,700 and increments of \$100 up to \$2,700 at the end of ten years. Supermaximums of \$2,800, \$2,900, and \$3,000 may be paid at the end of seven years.

Under the rules the financial reward for given periods of training will be the same for all, regardless of the grade in which he or she may teach.

Meritorious work, improvement in service, and recommendations by the supervising principal, principals, and supervisors will be prerequisites to all salary increases.

All teachers will be permitted to advance to succeeding maximums upon acquiring the necessary years of training. A total of 32 points will be considered the equivalent of one year of training but credits will become void after six years. The maximums for four and five years of training will not be recognized until the school year following that in which an institution has given degrees for these credits.

All credits for professional growth must be approved by the supervising principal. Additional professional training will not be required for the annual increment of any teacher who has passed his fifty-eighth birthday.

The supermaximum of \$3,000 will be given in three steps of seven-year intervals after the teacher has received the regular maximum of \$2,700. Six points of professional training will be a prerequisite for each supermaximum.

Each teacher must file with the supervising principal, before the last day of the first school week in September, original certificates of summer school, extension courses, or other evidence of professional growth.

Teachers, entering the school system with previous experience but who have not received credit for six points of professional training during a four-year period, will be allowed two years in which to meet this requirement.

Teachers employed in the future will be given credit, determined by their experience, training, and value to the system.

No deductions will be made for absences of less than ten days, due to personal illness or death in the immediate family. Days allowed for illness will be cumulative, making it possible for five unused days of any year to be added to those already accumulated. Teachers absent more than the total number of cumulative days will be paid the difference between their salaries and the amount paid the substitutes. Full pay will be deducted for absences due to business or personal reasons.

► Medford, Mass. The school board has increased the 1944 budget by \$90,000 to give all

regular school employees increases of \$200 in salary. The increases started on January 1 and apply to all employees in service one year or more.

► Amesbury, Mass. The school board has approved adjustments in the salaries of teachers, with increases ranging from \$50 to \$100 per year.

► Macomb, Ill. The school board has given all members of the teaching staff increases of 7 per cent in salary, with a minimum increase of \$125 per year. Janitors will receive a similar increase in pay.

► Barrington, R. I. The school board has accepted a recommendation from the superintendent, requesting that the cost-of-living adjustment action of the board be amended. Effective on November 1, it was suggested that all full-time school employees be paid from school budget funds, and that the salary adjustment be based upon the cost of living index issued monthly by the state department of labor and industries. The cost-of-living index has as its normal figure of 100 equal to the average over the period of three years, 1935 to 1939. It was voted that the ceiling figure for the cost-of-living index to school employees for the fiscal year 1943-44 be placed at 122.

► East Haven, Conn. The board of education has adopted a salary schedule for teachers and other personnel. The schedule, developed under plans outlined by Supt. Wm. E. Gillis and a committee of board members and teachers, is of the single-salary type, with beginners receiving \$1,200, \$1,300, or \$1,400 for a bachelor's, master's, or doctor's degree. The maxima of \$2,200, \$2,400, or \$2,500 will be reached over a period of 15 years for the bachelor's degree, 17 years for the master's degree, and 19 years for the doctor's degree. The schedule provides three increments of \$100, six of \$75, and the balance \$50. Teachers already in the service are placed on the new schedule on a graduated basis. Special groups are set up for principals, department heads, and special teachers.

### THE PLANNING OF VOCATIONAL DEPARTMENTS IN HIGH SCHOOLS

(Concluded from page 27)

It is desirable, however, to have a table and chairs in each shop to accommodate six or eight pupils. This will provide a center for pupils' written and research work.

It is not to be expected that this short article will serve as a manual for the planning of school shops, but the suggestions contained therein should make school boards aware of the problems involved in such planning and thereby enable them to critically examine the suggestions of their professional executives and the detailed plans submitted by their architects.

### COAST GUARD BUILDS TRAINING STATION FOR PETTY OFFICERS

(Continued from page 49)

All interior electric wiring is installed concealed in rigid galvanized conduit. Each large shop is provided with a conduit system known as a "bus" duct, which permits motor-driven instructional equipment to be installed at various points in the least amount of time. Lighting fixtures are almost all of the indirect type.

There is a combination electric clock and program system throughout all buildings, controlled by a master program device located in the administration building. In the infirmary a visible and audible low voltage

nurses' call system is provided. A closed-circuit interior fire-alarm system with general alarm and pilot gong installed in each building is supervised at a master control board also in the administration building. In addition a centralized radio sound system provides speaker outlets in all classrooms, in the mess hall and recreation room, and in the court formed by the students' barracks. This system is controlled from the administration building.

### THE PLANNING OF CLASSROOMS FOR POSTWAR SCHOOL BUILDINGS

(Concluded from page 18)

The picture of the Acalanes Union High School campus illustrates a highly acceptable plan solution, meeting the requirement that every classroom have its main windows face north.

The pictures of the Thomas Larkin School in Monterey, Robert Stanton, architect, illustrates the high even illumination achieved by bilateral lighting and a good indoor-outdoor relationship. In this case north facing windows could not be had, so good lighting is contingent upon proper adjustment of Venetian blinds.

In summarizing then, it may be said that if postwar classrooms are to be any better than those of prewar days, it will be because more intelligent and rational planning procedures are adopted and good school architects are commissioned to assist.

It will be because the educational profession goes to work now at the task of preparing its potential contribution to school-room planning with the knowledge that its ideas and recommendations will receive thoughtful consideration by school boards and their architects.

It will be because such concepts as standard classrooms, square feet per child, 12-ft. ceiling height, classroom span, unilateral light, some sun in every classroom, window area 20 per cent of floor area, classroom windows, 7-ft. setback for window bank, standard seating arrangement, and schoolroom brown, will no longer be permitted to wield the undue and restrictive influence upon classroom planning that they have had heretofore.

It will be because there are developed and used the broadly useful concepts: health conditioning, light conditioning, sound conditioning, study and work conditioning, optimum room sizes, design for flexibility in room sizes and shapes throughout the life of the building. These concepts for postwar planning will hold the planners responsible for securing essential humane and educational objectives but will not specify nor restrict the means.

It will be because the present tendency toward limiting elementary school buildings to single story construction will be strengthened as a means of encouraging the further development of natural lighting, the use of varying classroom spans, the indoor-outdoor classroom arrangement, and the selection of the best orientation for classroom windows.

It will be because no matter how highly rated a school building may be from the stand-

points of appearance, cost, and maintenance, it will not be considered worth copying unless the teaching staff finds the classrooms acceptable because they facilitate rather than hinder the educational work to be done.

It will be because neither central tendencies nor existing classroom standards determine the nature of postwar classrooms, but merely serve as the starting point for the development of classrooms in which children may live wholesomely and work effectively at the broad and interesting range of activities found in the modern school program.

### DR. FRANK W. BALLOU RETIRES

Dr. Frank W. Ballou, superintendent of schools at Washington, D. C., has announced his retirement after

the completion of 23 years of service in the schools of the nation's capital.

At a meeting of the board on October 20, Mrs. Henry Grattan Doyle, president of the board, presented a statement, in which she called attention to the splendid service rendered by Dr. Ballou during his long tenure as head of the school system. She spoke as follows: "It is impossible to express in sentences the devotion, the anxiety, the time, the strength of spirit and body that build a man's lifework."

"But we can survey with pride and admiration the solid evidence of a work well done. Dr. Ballou's energy and planning have built splendid buildings, with modern equipment, for school children. His ability as an administrator has built an efficient organization of four thousand men and women devoted to the education of the children of the city. His educational leadership has guided thousands of boys and girls into an adult life of good citizenship, patriotism, and high standards of living."

"An able pleader before Congress, an efficient administrator of a large and complex municipal school system, and an educational leader of teachers and pupils, Dr. Ballou leaves to the public schools the fruits of his labor."

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## STANFORD ACHIEVEMENT TEST

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## IOWA SILENT READING TESTS

*New Edition (Revised)*

By Greene-Jorgensen-Kelley

These tests have successfully served the schools for more than a decade. An extensive experimental program just completed has provided new nation-wide norms, new standard scores, and two entirely new Forms.

## TERMAN TESTS OF MENTAL ABILITY

McNEMAR

A thorough revision of the widely used *Terman Group Test of Mental Ability*, it offers decided improvements in administration, scoring, and interpretation. Norms are based upon the testing of more than 200,000 children in 200 communities in 34 states.

**World Book Company**

Yonkers-on-Hudson 5, N. Y. - 2126 Prairie Ave., Chicago 16

### Publications of Interest to School Business Executives

#### A Critical Analysis of Planning of Disbursements in Colorado School Districts

By Calvin Grieder. Paper, 23 pages. Bulletin No. 16, July, 1943, published by the University of Colorado, Boulder, Colo.

In this careful study, the author shows that, while in a large majority of districts the distribution of expenditures is not subject to serious criticism, there is need for a more careful supervision of local budgets and expenditures by state authorities. The study adds one more body of data to demonstrate the false economy and questionable wisdom of poorly financed and inadequately empowered state departments of education. In concluding his study, Professor Grieder makes six definite recommendations which he believes will be effective in improving budget methods and removing the chief difficulties in the way of district budgeting.

#### Federal Specifications

The Federal Standard Stock Catalog has been revised to include new specifications as follows:

CC-M-641. Motors, alternating-current, integral horsepower, 10 cents.

FF-T-311a. Thumbtacks, 5 cents.

GGG-W-631. Wrenches, bolt and nut, adjustable, 5 cents.

H-B-328. Brushes, hand-scrub, 5 cents.

OO-S-101. Sanders, portable, belt, disk, and oscillating, 5 cents.

SS-C-638. Crayons, chalk, white, 5 cents.

UU-P-545. Paper, stencil, duplicating-machine, dry-process, 5 cents.

#### Estimates of Future Population of the United States, 1940-2000

Prepared by Warren S. Thompson and P. K. Whelpton. Paper, 137 pages. Price, 35 cents. Published by the Government Printing Office, Washington, D. C.

This report, prepared by the National Resources Planning Board, gives forecasts of the growth and distribution of population for the period following the 1940 census. This information will be helpful to school ad-

ministrators and school-business managers in estimating school population and housing needs.

#### Relative Slipperiness of Floor and Deck Surfaces

Building Materials and Structures Report 100. Price, 10 cents. National Bureau of Standards, Washington, D. C.

A new method of determining relative slipperiness of floor surfaces under dry and wet conditions, with results of tests of a variety of materials.

#### Expenditures Per Pupil in City Schools, 1940-41

By Mary Ella W. Banfield. Paper, 33 pages. U. S. Office of Education, Washington, D. C.

This report offers a study of per pupil expenditures in cities, classified by groups according to population. The computations are based on current expenditures and pupils in average daily attendance.

#### The Puget Sound Region: War and Postwar

##### Developments

Prepared by the National Resources Planning Board. Paper, 160 pages. Published by the Government Printing Office, Washington, D. C.

This report has been prepared to aid citizens, educators, and others in making their postwar plans. It points out means for the expansion of services and facilities for the further well-being of the region's people. The report urges the preparation of a school-building program as a part of postwar planning. The discussion is based upon the recent program for enlarging school districts as recommended by the state survey.

#### Court Decisions Concerning the Powers of Pennsylvania Boards of Education

By Anson Mark Hamm. Paper, vi-111 pages. Published by the Pennsylvania Book Service, Harrisburg, Pa.

While the study underlying this volume was made in connection with a doctoral dissertation, the book has none of the earmarks of the usual thesis and is in fact a careful legal summary of the decisions of the Pennsylvania courts relating to the powers of boards of education in handling their finances, in erecting and maintaining school buildings, in carrying on their contractual business with individuals and business firms, in managing teaching personnel, in controlling pupils, in developing the curriculum, and in managing their own affairs.

The study takes up not only the important case law applying to schools but also makes clear the broad scope and the liberal powers granted to boards of education for promoting education and the welfare of pupils. The study concludes with cases up to August, 1940.

## ★ ★ Announcing ★ ★ OUR GLOBAL WORLD

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Grace Croyle Hankins

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Examination copy, \$1 postpaid;  
regular list price, \$1.32

**THE GREGG PUBLISHING COMPANY**

New York Chicago San Francisco Boston Toronto London

#### Statistics of State School Systems, 1941-42

Paper, 4 pages. Published by the U. S. Office of Education, Washington, D. C.

An advance report on state school systems, covering 35 states and the District of Columbia. It includes data on enrollment, average daily attendance, salaries of staffs, and average current expenditures per pupil. Of the 35 states, 27 showed decreased enrollments.

#### Planning and Financing School Buildings and Grounds

Published by the State Department of Public Instruction at Frankfort, Ky.

This booklet has been prepared to outline the regulations concerning the sanitary and protective construction of school buildings as required by the Kentucky state school code. It includes the statutes relating to construction, the minimum requirements for schoolhouse construction, and the regulations governing the financing of sites and buildings—all very moderate and practical for rural and small-city situations.

#### Here and There With Henry

By James S. Tippet. Cloth, 250 pages. Price, \$1. World Book Company, Yonkers, N. Y.

This second reader is based on community, farm, home, and child activities and interests, all intended to develop understanding and valuable social attitudes. Fine illustrations, a carefully developed vocabulary, originality of content make the book a useful supplementary reader.

#### Gregg Speed Building for Colleges

By John Robert Gregg. Cloth, 640 pages. Price, \$1.60. The Gregg Publishing Company, New York, N. Y.

This speed-building review of Gregg shorthand provides entirely new material for dictation and practice on an adult level. The vocational dictation includes materials taken from the newest fields of industry, business, and the professions.

#### National Dictation Studies

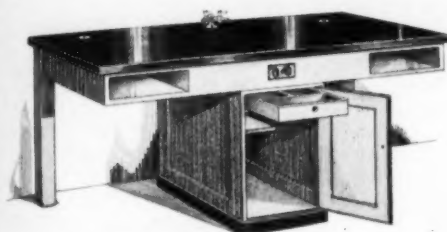
By Edward J. McNamara and Charles E. Baten. Cloth, 303 pages. Price, \$1.32. The Gregg Publishing Company, New York, N. Y.

This advanced book is planned to familiarize students with typical business letters and legal materials, and to step up speed and accuracy in everyday work.

The material, which is new, is organized into (1) word-retention exercises, (2) repetition exercises, (3) business letters, (4) legal material, (5) articles, and (6) New York State Regents' Examinations.

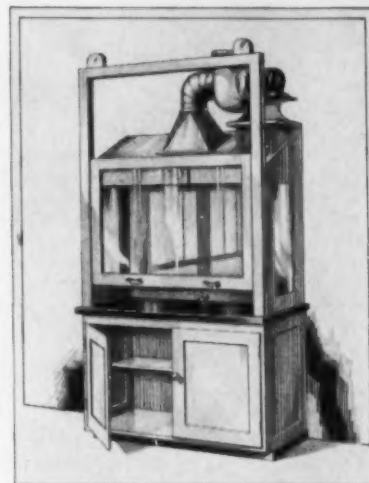
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## New Supplies and Equipment

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#### THE HUMAN EYE

Bausch and Lomb is honored to present *The Human Eye in Anatomical Transparencies* in Volume XIX, Number 2, their house magazine, a significant contribution to professional knowledge in the ophthalmic sciences. Newest authoritative data are incorporated to provide unquestioned technical accuracy.

Anatomical dissections of the eye are reproduced in natural colors on transparent acetate by the new "Trans-Vision" process. These full-color renditions are bound in register to portray in stereographic detail the complete serial dissection of the eye. As you turn the transparent pages carrying the color illustrations, you, in effect, remove layer by layer the sections of the eye, just as in a most skillful serial dissection. On the reverse of each sheet is the "back side" of each section, so that you build up or dissect at will.

Bausch & Lomb Optical Co., Rochester, N. Y.

For brief reference use ASBJ-110.

#### ERPI FILMS ACQUIRED BY BRITANNICA

The Encyclopaedia Britannica has purchased the Erpi Films' Library, which is used extensively in classrooms throughout the United States and many foreign countries. Ownership of Erpi Classroom Films, Inc., brings into the Britannica organization the world's largest producer and distributor of instructional sound film.

Included are over 200 educational subjects in 16 fields of knowledge, embracing films in the fields of American history, animal life, art, astronomy, athletics, chemistry, child growth, geography, music, social sciences, and social studies.

The policy and personnel of Erpi Films are expected to continue under Britannica ownership.

Encyclopaedia Britannica, Inc., 20 No. Wacker Drive, Chicago 6, Ill.

For brief reference use ASBJ-111.

#### RADIO AT WAR

Available for release to schools, colleges, and civic organizations shortly will be the action-laden film, "Radio at War." Communication is playing a determining role in the present war and this 24-minute presentation on 16mm. sound film portrays the adventures of two typical American boys in the Signal Corps and the Navy.

Training camp routine is pictured in interesting detail, followed by scenes taken at actual maneuvers during which many phases of electronic communications are brought into play. Moving forward, the film carries the boys into convoy action in a battle sequence.

The film may be had on payment only of transportation charges.

Educational Dept., R.C.A. Victor Division, Radio Corporation of America, Camden, N. J.

For brief reference use ASBJ-112.

#### NEW PRICES ON U.S.O.E. FILMS

New prices on U. S. Office of Education training films, to amortize cost of production, became effective October 1 with the awarding of the 1943-44 distribution contract to Castle Films, Inc. The new contract also provides for a 10 per cent discount to schools.

The price increase to amortize the cost of production applied only to those films produced by the Office of Education and does not affect the Army and Navy films and film strip released through the Office of Education. List prices on the Army and Navy films have been increased slightly but with granting of a 10 per cent discount to nonprofit-making purchasers, the net price to schools remains the same as it was last year.

Under the new contract, a 10 per cent discount on all U.S.O.E. films will be given to school purchasers. Such purchasers are also exempted from paying the federal excise tax, provided they present a tax-exemption certificate. This tax-exemption certificate will constitute evidence for granting the 10 per cent discount. Without a tax exemption certificate, no tax exemption and no discount can be allowed.

The list of U.S.O.E. films cover titles under Precision Measurement, Engine Lathe, Milling Machine, Vertical Boring Mill, Shaper, Radial Drill, Shipbuilding Skills, Bench Work, Single Point Cutting Tools, Sensitive Drill and Vertical Drill, 48 films in all now available.

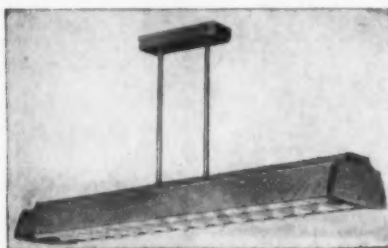
Castle Films, Inc., R.C.A. Building, New York, N. Y.

For brief reference use ASBJ-113.

#### NEW LIGHTING FIXTURES

The government has relaxed to some extent the priority regulations covering the manufacture of fixtures for drafting room lighting equipment. As a result it is possible to manufacture and offer a series of fluorescent units for office and drafting rooms on A1J priorities or higher.

The Grenadier, illustrated, is representative of the units now offered under the relaxation of the War Production Board. The Grenadier is available for ceiling or suspension mounting, is equipped with etched ribbed glass, to reduce brightness of the lamps to prevent glare.



The New Wakefield "Grenadier."

Other units now offered are the Captain for general illumination where lighting requirements are not severe; the Beacon, a glass paneled unit in which the brightness of the lamp is materially reduced by frosted rib glass; and the Admiral, a lighting unit made largely of wood which receives a large component of downward light with very little in the upward direction. All the units meet weight limitations as to steel content of WPB.

F. W. Wakefield Brass Co., Vermilion, Ohio.

For brief reference use ASBJ-114.

#### DE VRY RELEASES PATENTS

In celebration of the 30th anniversary of its founding, De Vry Corporation announces the conclusion of arrangements whereby several of its patented projector mechanisms are released for manufacture for the Armed Forces.

W. C. De Vry, president, explains the corporation action in the fact that the U. S. Army and Navy need patented De Vry equipment in larger quantities and at a rate of production in excess of the company's capacity to produce. Rather than expand its facilities with the expense of time and funds involved, the patents are released to subcontractors royalty free for the duration.

#### ARMY-NAVY "E" PENNANT

Holtzer-Cabot Electric Company, Boston plant, Boston, Mass., has been awarded the Army-Navy

"E" Pennant as announced by Under Secretary of War Robert P. Paterson and Under Secretary of the Navy James V. Forrestal. Employees will be given Army-Navy "E" pins.

#### SLOW DELIVERIES OF SCHOOLBOOKS AND INSTRUCTIONAL MATERIALS

Mr. E. S. Thompson, of the business division of the San Diego (Calif.) city school system, has prepared the following statement concerning slow deliveries of text and library books and instructional materials. The statement is of value to all school authorities in that it explains quite clearly the difficulties under which publishers and school supply manufacturers are working at this time.

"School deliveries of supplies, equipment, and other material are expected to be much slower during the next six months. The reason for this can be blamed to government control of material, transportation, and labor.

"Nearly all of the materials used by the schools are under government control. Supply items containing metal are reduced either to a bare minimum necessary for the continued operation of the plant, or entirely eliminated. For the period of a year after the declaration of war, the schools operated under the lowest priority rating extended by the War Production Board. This greatly handicapped the purchase and fulfillment of school orders. Controls have been placed on the amount of inventory that may be maintained, and the amount of materials that can be ordered for a certain period.

"Deliveries to the warehouse, and deliveries from the manufacturers to the firms have been greatly curtailed. In our local situation, where deliveries were formerly made daily, they are now on a weekly basis. Shipments coming from outside the state are delayed and held due to military movement. It is expected that in the next six months the civilian needs for this area will be further curtailed by the increased military activities in the Pacific war zone.

"The labor situation has been another contributing factor to delayed deliveries. The turnover of help both in our warehouse and the firms has been alarming. The inability to secure efficient replacements, and the longer training period required, has slowed the service.

"The suggestion we wish to extend is that the schools continue to be as patient and understanding as they have in the past. Effort should be made to anticipate needs well in advance of the time the material is to be used in the classroom. The warehouse is doing everything possible to maintain normal operations, and any assistance from the schools will be appreciated."

#### AMERICAN SCHOOL BUILDINGS STUDIED

A building mission representing the British government has been touring the United States for the purpose of examining school buildings. The mission is composed of Sir James West, Alfred Bossom, Sir George Burt, V. C. R. Head, J. B. Harris, and T. G. Boxall.

It is expected that the mission will make extensive recommendations on the basis of which the blitzed school buildings of London and other British cities will be planned anew and erected.

► WILLIAM C. MERRILL, a member of the school board at Cherry Beach, Mich., died on November 15.

► M. H. DETWEILER, of Ziegler, Ill., has been elected president of the Illinois Association of School Boards.

► DR. JOHN PARK has been elected superintendent of schools at Albany, N. Y., to succeed A. R. Coulson.

► SUPT. ROY E. SIMPSON, of South Pasadena, Calif., has been elected president of the Association of California Public School Superintendents.

► MISS LILLIE R. ERNST, a former assistant superintendent of schools and principal of the Blewett High School in St. Louis, Mo., died at her home in that city on December 6. Miss Ernst, who had been retired since 1941, was a familiar figure, in mannish clothes, at educational conventions.

► O. RICHARD WESSELS, of the War Production Board, Washington, D. C., has been named "dual" Associate Professor of Business Education and Secretarial Science for the School of Education at Syracuse University, Syracuse, N. Y.

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### CONSTRUCTION PERMITTED

The War Production Board has recently given recognition to the fact that the cost limits set forth in Conservation Order L-41 are too small to permit the owners of large manufacturing plants and other substantial buildings to carry on necessary incidental construction. Consequently, the board will consider applications from the owners of such plants and buildings for permission to do miscellaneous routine construction over a fixed period of time. For such routine construction as is considered essential a property order will be issued. This new policy is of especial importance to boards of education in connection with additions and other, necessary school-building construction projects.

The application should be made on Form WPB-617 (formerly PD-200 Revised). Separate applications must be made for each project as defined in paragraph A-8 of Order L-41. The materials list should be filled out and broken down to the extent possible, but may be based on estimates, inasmuch as it is impossible to list accurately all materials required for such jobs over a six months' period. Materials on hand, including those salvaged, should be included. Items for which priority assistance or controlled materials allotments are needed should be indicated and the quarter in which deliveries are required should be stated. The general nature of the construction must be set forth, and all applicable questions on Form WPB-617 (PD-200 Revised) must be answered. The application in all cases should be filed with the War Production Board, Washington, D. C.

The order issued pursuant to the application will authorize the builder to perform miscellaneous routine construction, using the materials listed in the application as approved. Priority assistance and allotments of controlled materials will be granted only for jobs essential to the war effort. While the blanket order will cover a number of jobs, no one job costing more than \$10,000 will be authorized and in certain instances a lower cost limit per job may be fixed. The blanket order will also contain a cost limit as to the total construction authorized. The period of time to be covered by the order will be six months or less.

A report on the materials actually used and the construction performed will be required at the termination of the order. This report should be made on Form WPB-617 (PD-200 Revised) and the materials should be broken down to the extent required under said form.

### BUILDERS' HARDWARE

The War Production Board on November 30 released three million pounds of fabricated copper and copper alloy parts for use in the manufacture of building hardware, cabinet locks, and padlocks.

### TYPEWRITERS OBTAINABLE

The Office of Price Administration on December 1 eased its rationing regulations affecting the rental and sales of used typewriters. All persons desiring them may rent typewriters regardless of their date of manufacture. Priorities, of course, must still be obtained by those needing the typewriters for essential war work.

All restrictions on the sale of office-size typewriters, built before 1924, have been removed. Portable machines, built before 1941, are also released for unrestricted sale. No office-size typewriter, manufactured after 1924, may be sold to private users, but anyone having one machine may sell it to business firms and individuals requiring it for business purposes.

### ELECTRIC METERS AVAILABLE

Small electric meters are available from six small manufacturers, and may be obtained by schools and colleges on the AA-2 rating form CMP-5a.

While the War Production Board does not recommend the products of the smaller manufacturers, they do believe that schools and colleges should investigate these houses before they apply for a higher rating required to purchase from the larger makers.

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than grammar-school—*



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**T**HEY learned the lessons of liberty in thousands of classrooms, at desks and seats made by American Seating Company craftsmen.

Now, these young men learn the stern arts of air warfare on the stout airplane wings produced by the same "American" artistry. And many of the most famous combat and trainer planes are equipped with pilot seats designed and built by American Seating Company.

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